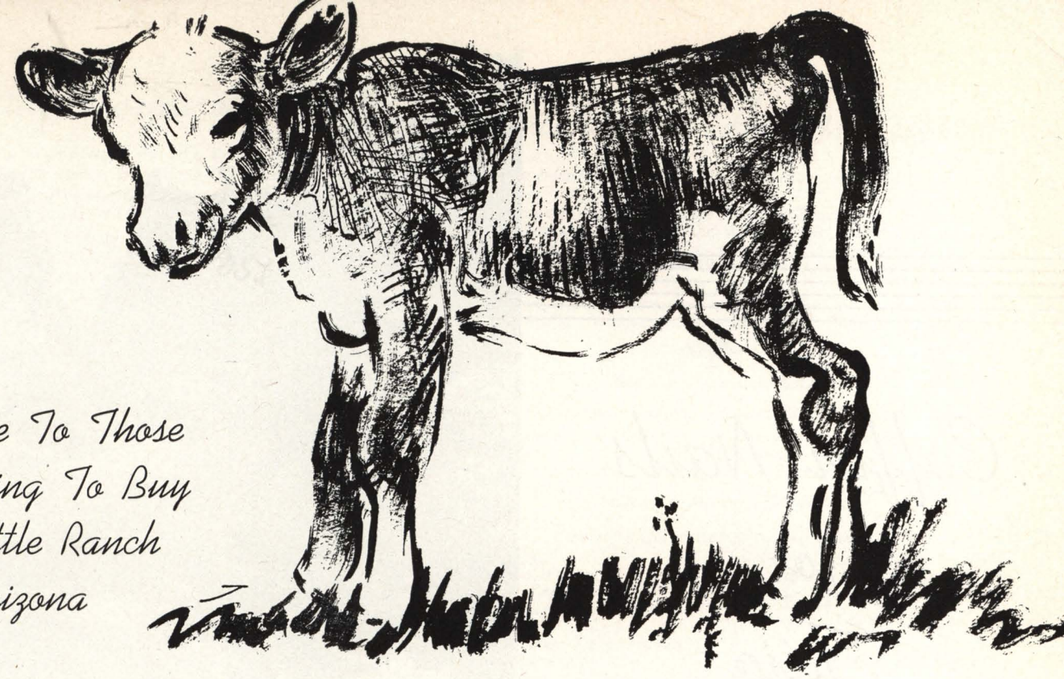
"EL RIO VERDE" *C. KIRK*

Arizona HIGHWAYS

March 1943



Advice To Those Wanting To Buy A Cattle Ranch In Arizona

DRAWING BY RAY STRANG

There are ranch properties for sale in Arizona—all the way from a few thousand to several hundred thousand dollars. There are ranches that couldn't be bought for a king's ransom, and there are ranches that aren't worth half the price being asked for them.

The market is not glutted with ranch properties. A properly managed cattle ranch is a valuable property and good buys in the ranch market are few and far between. Anyone planning to buy a cattle ranch should go thoroughly into the question and there are questions galore that arise in this business. Water, range, forest permits, markets, help—all these things require study and knowledge. When you start out to buy your ranch (and these remarks are especially directed to the many easterners who have made so many inquiries these past two years) if you cannot tell a heifer from a fence post it would be well to secure some expert advice (and such advice is available) before you buy. As a whole, cattlemen are the finest sort of people to do business with because honesty is as much a part of their code as hospitality. Then, too, sharps in the cattle business do not last long. They just do not fit in with their neighbors. But it must be remembered that a cattleman is a good businessman and as ready to drive a bargain as the next person. Therefore, when you go shopping for a cattle ranch fortify yourself with some information before you attempt to conclude the deals.

People make money and lose money in ranching. Yet with application and common sense, a comparative newcomer can make a "go" of a ranch. One of our successful ranchers was a former dealer in antiques. He left the east because he always wanted a ranch. He runs his business with all the efficiency of a bank. And he has a darn good time.

Another person we know had a small plumbing business in Phoenix. He went to Payson, got an outfit of about 50 cows and made a good living. His was a one-man ranch and he, too, had a darn good time.

A ranch in Arizona, though, is more than a matter of dollars and cents. The sentiments of "Home on the Range" are not only a poetic expression of a song but a philosophy of life in the west. Whoever heard of anyone buying a piece of real estate in a city to settle down on. But a ranch can be more than a home; it can be a retreat and a refuge, some place where you could go to settle down and where you'll have time to think and time to listen to your neighbor and admire very much having him call, simply because he is your neighbor. On a ranch, too, you are closer to the land and closer to the stars and there is moonlight and the smell of cattle and the sound of wind in the cottonwoods. All that is something you don't get with dollars and cents, but it is there all the same.

There are many advantages to ranch life. There are disadvantages, too, to ranch life, but some of the ranchers who grumble the most about it wouldn't leave their ranch for a million dollars. . . R. C.

"CORRAL," A RANCH STUDY BY JANE COTTRELL, ON HER RANCH NEAR PAULDEN

Coffin Nails for Tojo

Only yesterday, it seems, the campus of the University of Arizona at Tucson was another college campus peopled by American youths, who bustled around in good health and full of the meaningful chatter of football games, dates, and the so important frivolities of their time and place. A visitor seeing them in their daily existence three or four years ago would little believe that these young people would be called upon to be in the front of the battle to make the world both a better and less hazardous place in which to live. So many of these young men have scattered now from that peaceful University campus in Tucson, acquitting themselves with honor on the distant battle fronts of the world, proving the power and the might of their American Republic and the American way of life.

And the campus, too, at the University at Tucson wears a militant air today as hundreds of Naval Reserve officers undertake the 60-day indoctrination courses given there by the Navy. Arizona Highways goes into further detail this issue explaining the why's and the wherefore's of the Naval School. This, too, could be called a chapter in the workings of the American Democracy.

All of these schools and training fields in Arizona, both the Army and Navy are becoming so familiar to us we take them now as a matter of course. But the significance of them should never be lost upon us by that very familiarity for they represent all the strength, all the resolve, all the might of our people and the way we live.

The Naval School is more than a school to quickly prepare officers for line of duty on ships that will go to battle on all the seven seas. Such is the primary purpose of the school and that the task is accomplished well and with dispatch speaks of the high efficiensy of the officers at the school, many in the late 20's and early 30's, who have put aside their civilian habits and thought, to submit readily and easily to the stern discipline of Naval training and tradition you're proud of, as an American, and you have a right to be.

Coffin nails for Tojo and other characters of low repute are being made all over America today, while other Americans, like those Naval officers at the University in Tucson, are getting ready to drive them. In the end all the nails will be put in their place and there won't be Tojo any more. In many respects we Americans are a rather magnificent people and we realize it the more when we draw back and observe ourselves in action (Tokyo papers, please copy.) . . . R. C.

"MOUNTAIN ROAD" *Norman G. Wallace*

THE SCENE: BETWEEN MIAMI AND SUPERIOR, U. S. 60, 70

So Gentle the Breezes of March

And so March comes to our land, the soft month when Winter reluctantly leaves and Spring comes in gaily to the music of the soft breezes in the fresh green leaves of the cottonwood along the washes and gentle chatter of the mesquite and the palo verde.

The sun is mellow warm, not hot, but comfortably warm, fresh and clean with the newness of Spring. In the desert the lazy long afternoons begin and in the mountains one hears the drone of the early insects coming from where insects come who retire for the winter.

* * *

And for this month we present as our coverpiece a study of the Verde River. The Verde, as rivers go, isn't big, but it comes a long way and does a lot of good and a lot of hard work in its journey from the hills of Yavapai to the sea. Along this river, too, as along most of the streams in the Southwest, history has been written and men have died. In the hot dry summer the Verde, loafing along near Cottonwood, can be as dry as cotton. Again it can swell up to the size of large rivers and growl and roar as if angry with all creation and ready to tear the world apart. Mr. Kirk made his study of the Verde in the rugged mountains just before the Verde drops into the Valley of the Sun. The mountains are large and gruff and formidable but no task at all for the little river, which, with all the patience of time itself, overcomes all obstacles and goes on endlessly to the sea which is never full.

* * *

We have several features this issue which may interest you. There is a brief notation on the Easter Sunrise Services to be held at the Grand Canyon of Arizona. From the South Rim of the Canyon as the sun erases night's Stygian blurr, voices will lift to a thousand Hallelujahs! and the words of Jesus will sound forth. Through the agency of the radio the services will be sent to all the world. These services this Easter should be especially significant to us all, for now the forces of Darkness are trying to extinguish the Light, and the Light will flame brightly forever for it, too, is as ageless as the Canyon. There is no Peace on Eearth now but Peace lives forever in the hearts of a righteous people in the strong land, who are brave and free and will remain so.

* * *

For a pictorial footnote we take you again to Oak Creek Canyon, always refreshing no matter how often the tale has been told. And if you would like a different trip from that to Oak Creek, we might suggest that you follow El Camino del Diablo, the Devil's Highway, that twists and coils like a serpent through the Sonora desert between Arizona and Sonora. That distinguished Arizona pioneer, Jim Barney, gives us some of the history of this road, which has claimed so many lives.

* * *

To bring you up to date on the activities of your Navy in Arizona, Lt. Frank N. West, jr. U.S.N.R., and Ted Miller Pho. M 3/c U.S.N.R., of the Navy's 11th district public relations office in Arizona gives us the story of the Naval Indoctrination school at Tucson, These gentlemen were with us last month telling us of the Pre-flight Naval School at Prescott. These Navy folk have a way of getting things done.

* * *

We conclude in this issue a series of articles on the Southwestern National Monuments, presented with the assistance of the National Park Service. All of these articles with additional material is to be presented in book form by the Southwestern National Monuments Association, and when the book is ready we'll let you know for it will be an addition to anyone's Arizona library.

* * *

The sun has brought many people to our land, but one of the strangest was Frank Holme, a newspaper illustrator from Chicago, a great man, in every way. He wandered out just at the turn of the century and is notable to us for his activities on the Bandar Log Press, of which Frederick Cromwell of the University of Arizona tells us more in these pages. You'd enjoy knowing Frank Holme.

* * *

All of which about fills the bill for the month. We're just a month behind schedule but if you'll have patience with us we'll catch up. We should come out the first of each month, when things are running smoothly, but we hope that the delay will not have you enjoy the magazine the less. Good health and under April just "So long!" . . . R. C.

Arizona Highways

the friendly journal of life and travel in the old west

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Raymond Carlson, Editor

"Civilization Follows the Improved Highway."

VOL. XIX. MARCH, 1943 No. 3

for march, nineteen forty - three
one month nearer victory,
arizona highways,
a magazine of america and the west,
is pleased to present:

"Peace On Earth . . ."

BY JEAN ANDERBERG
Student A. S. T. C., at Flagstaff

Here, in the deep, rich, reverent heart of America, on the rim of the Grand Canyon of Arizona . . .

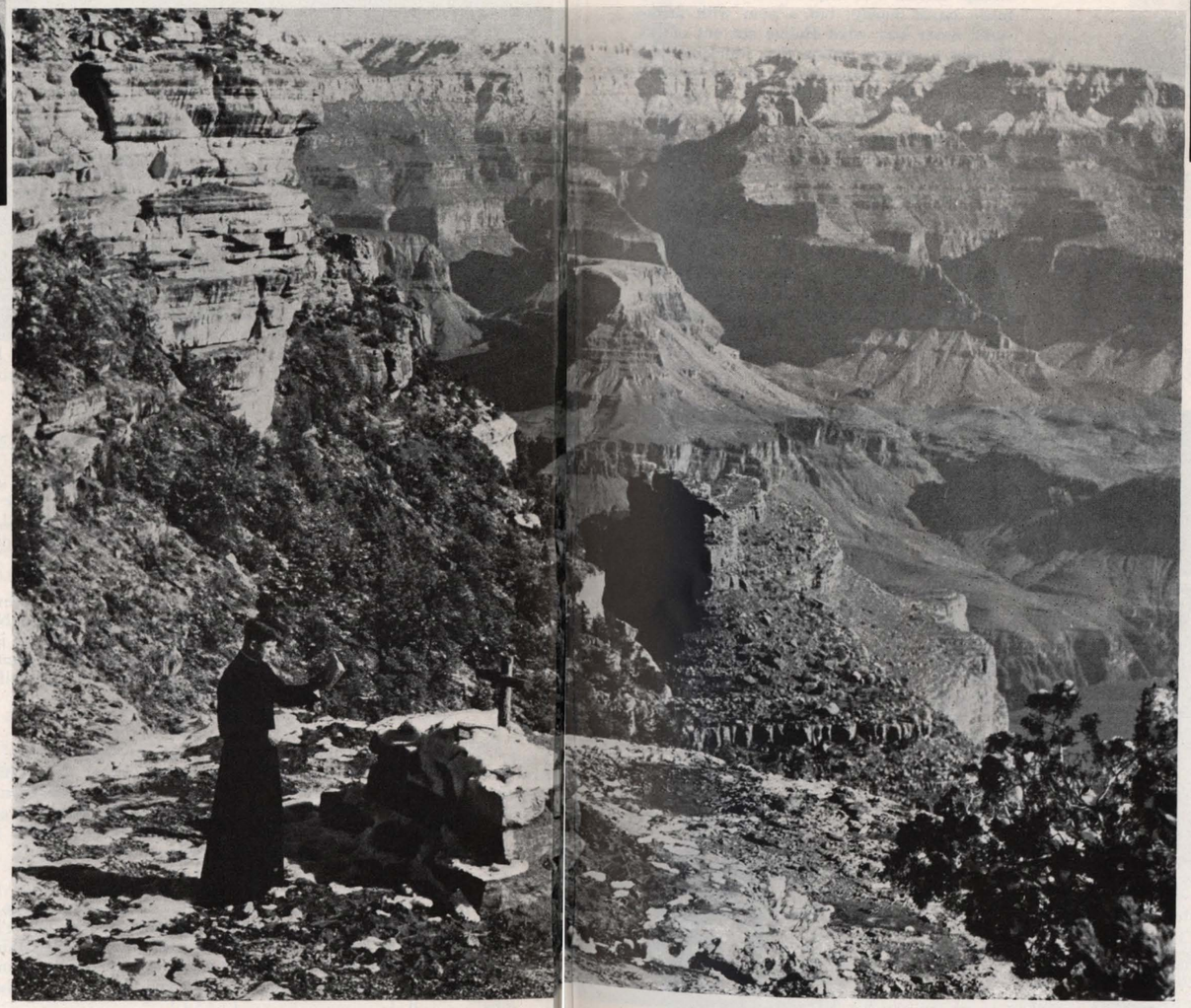
IN THE STILL HUSH of the early dawn just as the sun rises and sheds its light to reveal the majestic beauty of the Grand Canyon of Arizona, a message of peace will be broadcast to the world on this Easter morn, Sunday, April 25, in the year of our Lord nineteen hundred and forty-three.

While on the far-flung battle fields, our soldiers are fighting for the preservation of freedom, for the right to worship God and for the right to live in peace, Easter again comes to remind us of Him, who suffered on the cross that we might live. Millions of people will come with revered feelings to worship on this Easter day, and pray for those who are not with them; for this year Easter takes on new and greater significance. Easter services throughout the country will be the shrine of many worshippers. One of the most beautiful and awe-inspiring of these is the service which is held annually at the Shrine of the Ages on the brink of the Grand Canyon of Arizona.

The message of peace to be found in the 23rd Psalm, theme of the broadcast, will be read by the Reverend Lloyd Cox of Williams:

"Yea though I walk through the valley of the Shadow of Death, I will fear no evil;: for Thou are with me; Thy rod and Thy staff they comfort me. . . "

. . . the Message of Easter will be sent to all the world at sunrise on Easter Sunday . . .



These words will resound to the depths of the Canyon and over the air waves as the sun reflects on the Canyon walls the promise and hope of a new day.

Voices of the A Capella choir of the Arizona State Teachers' College at Flagstaff, directed by Dr. Eldon A. Ardrey, will be lifted to the heavens in song and praise of the Lord God Almighty.

And as the dark curtain of night slowly lifts from the Shrine of Ages on the rim of the Canyon and in the quiet dark blue early light, the voice of J. Howard Pyle will bring to the radio audience a picture of sunrise at the Grand Canyon.

Each year many come to witness the program and the beauty of the Canyon on Easter morn. Because of the lack of transportation facilities, those who would come to the Easter Service will have to remain at home. But they may visualize the picture of the Canyon from their easy chair by the radio.

The pinnacles and crevices of nature's mighty handiwork will emerge from the black shroud of night. The radiant light of the sun will fill the Canyon with bright colors from brilliant red to deep purple, as if an artist had used only the richest of paints from his palette. These spires of color may well remind us of a cathedral, the most magnificent cathedral of them all; for on the very walls of this Canyon is written the story of time, the story of life. Here is revealed for all to behold the proofs which would make the skeptics believe! Carved in the indestructible layers of rock is the story of the beginning when God created the heavens and the earth.

. . . proclaiming the piety and strength of a peace-loving people at war.

Frank Holme (or John Francis Holme as he was known to Who's Who in America, 1903) pictured by his friend Walter Clute in 1898. Clute, a well-kown artist, was on the staff of the Chicago Daily News at the time. Holme, a great artist and a great man, came to Arizona for his health and to pause briefly in the sun.

Bandar Log Press and Frank Holme (center) in the press-room, a converted chicken-house on a ranch near Phoenix in 1903. The Washington hand-press figures greatly in Arizona printing history, but it has disappeared. If you have it in your attic, please communicate with Mr. Edwin B. Hill, Ysleta, Texas, President of the Frank Holme Memorial Group. The picture was taken by Will Robinson, one of Arizona's pioneer authors.

Illustrations from the Frank Holme collection at the University of Arizona

The BANDARLOG PRESS *the Story of Frank Holme*

BY FREDERICK CROMWELL, *Acting Librarian, University of Arizona*

IF YOU have lived in West Virginia, Pittsburgh, Ysleta, Texas, Chicago, San Francisco, or Arizona—if you have been a newspaper man, an illustrator, or a book collector—if you were alive in 1900 you may have heard the name Frank Holme.

Frank Holme had genius, a genius with pen and pencil and a genius for friendship. His friends in effect "incorporated" him in an effort to raise money and save his life; years after his death his friends and those whom he had inspired formed a Frank Holme Memorial Group. Holme was impractical and he never made much money; but a man with money could never buy what Holme got out of life. He was a strange genius who wandered west to Arizona and paused briefly in the sun.

When Holme died, at the age of thirty-six, one of his co-workers wrote in the Denver Post: "There was something remarkable about Frank Holme. People said good things about him before he died . . . When such men as President Roosevelt, Chauncey Depew, Mark Twain, George Ade, John McCutcheon, Grover Cleveland, and a score of other prominent men in the art and business world paused to pay a tribute to Frank Holme, it is little wonder then that thousands and tens of thousands of people followed the work of one of the cleverest newspaper artists of the day."

The accident of ill-health brought Holme to Arizona and thus increased our special interest in him. But in the 1890's Holme made his reputation, chiefly in Chicago, as an extraordinary newspaper artist and a teacher of illustration. Holme knews newspapers, having been a reporter and a type-setter; and in a day when many newspaper illustrators "faked" their pictures, Holme drew "on location." Once, hard-pressed for lack of paper, he drew a news scene on his cuff; and hard-pressed also for time, he turned the cuff over to the engraving department.

"He has been in the thick of political campaigns, accidents, strikes, famous trials, national celebrations—all the moving events of the day," said one of his contemporaries. "He has learned to draw steadily, perched on the unsteadiest coign of vantage; if need be, with rain pouring down upon his paper; with shouts of excitement ringing in his ears, or missiles flying past them; with rolls of smoke now obscuring, now revealing, blackened walls and crawling human beings that he must note in hurried glimspes."

Mr. Edwin P. Hill, of Ysleta, Texas, President of the Frank Holme Memorial Group tells us that Holme was born in West Virginia; experimented in wood-cuts, chalk-plates, and zinc etchings while working in the art department of the Wheeling Register; attracted wide attention through his pictures of the Johnstown flood in the New York Graphic; and moved to Chicago where he worked as reporter and "assignment artist" on five newspapers—from one of which he resigned because a time-clock was installed. In Chicago he married, gave art exhibitions, founded the Palette and Chisel club, started his excellent School of Illustration, and, possibly of most interest to us, founded the Bandar Log Press.

Founded? "Founded" is too solid a word to use in connection with the Bandar Log Press, the very name of which was taken from the Monkey-folk of Kipling's Jungle Book. Why Bandar Log? "Listen man-cub," said the Bear, and his voice rumbled like thunder on a hot night. "I have taught thee all the law for all the Peoples of the Jungle—except the Monkey-folk who live in the trees. They have no law—they boast and chatter and pretend that they are a great people about to do great affairs in the jungle, but the falling of a nut turns their minds to laughter, and all is forgotten . . ." Yes, the Bandar Log people were monkeys who carried a stick half a day, meaning to do great things with it—but forgot what.

So Frank Holme became, f o n d l y, Mr. Bandarlog. And the first issue of the press, a collection of humorous verses entitled "Just for Fun" took a year or so to get through the press, its progress being interrupted by Holme's travels, his conversation, his various work, his zest for other plans, or simply his inabilty to persuade his friends to concentrate on his press-work.

Of this first Bandar Log book, printed in Chicago in an edition of 74 copies, Holme said, "The book's title 'Just for Fun' explains its purpose . . . In many points it will doubtless shock the practical printer, but it has taken long enough in the making to weaken any possible desire to do it over again. Besides, most of the composition was done by my wife . . ."

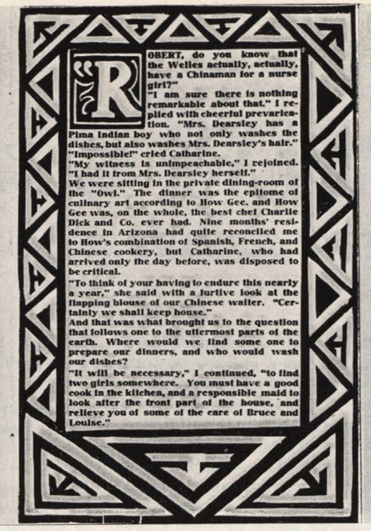
"Swanson, Able Seaman" was his second book to appear from the wandering Bandar Log press in 1901 at Ashville, North Carolina, where Holme had gone for his health. Will Ransom notes that most small private presses are not taken seriously by collectors or connoisseurs, but one, the Bandar Log press, has made a "poignant impression" on him. He defines a private press as "an enterprise conceived, and masterfully and thoroughly carried out by a creative artist who does his work from a sincere conviction that he is expressing his own personality."

Doctors finally decided that Holme should come to Arizona—and so the first private press arrived in Arizona in 1902—the first in Arizona, and probably the first in the world incorporated in order to help save a man's life. For the loyal friends of Holme did incorporate the press and sold $25.00 shares in it to raise funds for his fight against tuberculosis. Among the shareholders were George Ade, Mark Twain, Charles Dana Gibson, and Booth Tarkington—Mark Twain came in late after all the stock was sold and had to pay $50.00 for his share. Other shareholders, whose art work

Spanish-American war troop train leaving. Today press photographers cover such events; in the 1890's Frank Holme drew such scenes swiftly with pen and pencil "on location."

A Holme illustration for George Ade's Clarence Allen, the Hypnotic Boy Journalist, volume two of the Strenuous Lad's Library. The little booklet was printed "from worn type."

Will Robinson's first book, and the last publication of the Bandar Log Press in 1903. Design and woodcuts by Holme in red, black and grey Indian blanket patterns.


"ROBERT, do you know that the Welles actually, actually, have a Chinaman for a nurse girl?"

"I am sure there is nothing remarkable about that." I replied with cheerful prevarication. "Mrs. Dearsley has a Pima Indian boy who not only washes the dishes, but also washes Mrs. Dearsley's hair."

"Impossible!" cried Catharine.

"My witness is unimpeachable," I rejoined. "I had it from Mrs. Dearsley herself."

We were sitting in the private dining-room of the "Owl." The dinner was the epitome of culinary art according to How Gee, and How Gee was, on the whole, the best chef Charlie Dick and Co. ever had. Nine months' residence in Arizona had quite reconciled me to How's combination of Spanish, French, and Chinese cookery, but Catharine, who had arrived only the day before, was disposed to be critical.

"To think of your having to endure this nearly a year," she said with a furtive look at the flapping blouse of our Chinese waiter. "Certainly we shall keep house."

And that was what brought us to the question that follows one to the uttermost parts of the earth. Where would we find some one to prepare our dinners, and who would wash our dishes?

"It will be necessary," I continued, "to find two girls somewhere. You must have a good cook in the kitchen, and a responsible maid to look after the front part of the house, and relieve you of some of the care of Bruce and Louise."

Two pages from a little booklet Holme issued in Phoenix explaining the Bandar Log Press and giving some of his ideas on printing.

is familiar to many of us today and who were associated with Holme in his School of Illustration in Chicago, were John T. McCutcheon, the two Leyendeckers, and the master of type design, F. W. Goudy. Other names on the list stir memories: Charles Warren Stoddard, Julian Street, Augustus Thomas, Elbert Hubbard, Finley Peter Dunne . . .

The Bandar Log Press came to rest on the Shorgl ranch, three miles north of Phoenix on the Black Canyon Road. Here, in tents, lived a small colony of health-seekers which Holme joined. The printing press itself landed in the corner of a converted chicken house; some of the printing was done there amid confusion and improvised furniture; some was done in Phoenix.

Read about the outfit in the words of Frank Holme set forth in a brochure issued from the Press in 1903:

"The Bandar Log Press marks an epoch in the history of printing. It is a link connecting us with the early days, when Gutenberg and Fust were in the business and modestly offering a general line of book and job work to the honest burghers of their time . . . But, ah! how times have changed . . . Then a cut was n. g. unless it would print on a hay press with apple butter for ink, and the boy who inked the formes for the hand press of the period most likely wore whiskers made in Germany and experienced all the 'joy in his work' that the arts-and-crafts-man of today professes to feel.

"Nowadays a new type face comes out every few minutes; night and day the giant presses go on grinding out their grist of printed matter . . . But to the serious observer—and this, of course, means you, reader—the most heart-rendering part of the whole business must be the now almost universal striving for mechanical perfection; the effort to make the operator more and more a part of the machine.

"In every article relating to printing that you pick up nowadays you are bound to run across the words 'dignity' and 'simplicity.' Also 'harmony' and 'legitimate use of materials.' But when it comes to 'legitimate use of materials' that's the Bandar Log Press's long suit . . . In the revolt against machinery it accompanies the pendulum to the limit of its swing.

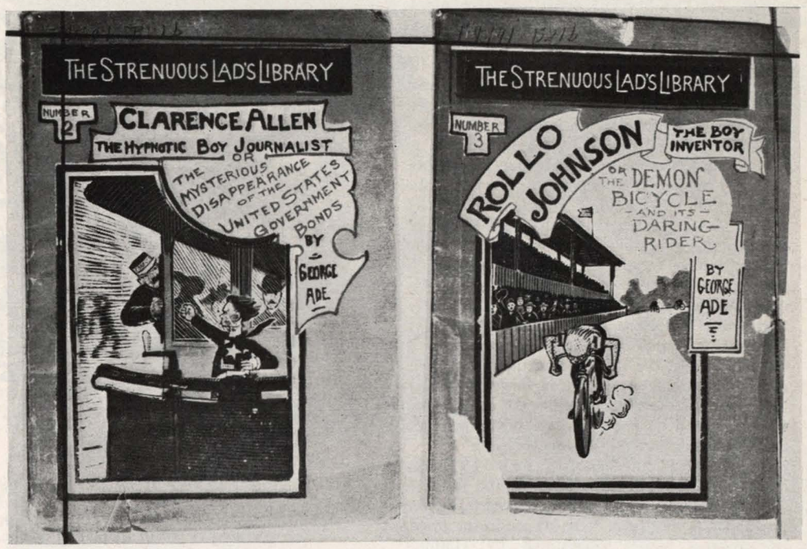
"The books, being handmade are naturally produced slowly and in necessarily limited editions. Every stockholder gets a copy of each book free and some extra copies are usually printed in order to give to others the opportunity to share in the almost unearthly joy of possessing a book from the Bandar Log Press.

"One word about the location of the press and we leave you to your meditations.

"Its location depends entirely on the printer.

"As we go to press with this it is in a Mexican office in Phoenix, Arizona. It's here because a series of burlesque dime novels by George Ade are in process of construction and as this form of literature is not usually issued in deluxe editions a bum job was desired for the sake of preserving the 'harmony' . . . This office has a hand press that may have come over with the Spanish Invaders and some cases of type that are indubitably old . . ."

The "Poker Rubaiyat" was the most ambitious and pleasing of the Bandar Log productions. The prospectus announced that "The chopping out of the 106 color and key blocks required enough manual labor to satisfy the most ardent admirer of the handmade product . . . While not intended as a book to give to the baby to play with, still, he, if it is the right kind of baby, will be able to learn his letters from the initials and to become familiar with the face



The covers of two George Ade-Frank Holme productions burlesquing the popular dime-novels of the day. Only 374 copies were printed.

charter gives it authority to conduct a general publishing and bookselling business anywhere within the limits of the United States, excepting only Montana and Nevada.

The stockholders have, with truly remarkable unanimity, declined to assume any responsibility whatsoever, either for the subject matter or the appearance of the publications issued by the press, and have dumped it all upon one individual, who bears it lightly, singing as he works at sorting out "pi" or cleaning rollers with benzine.


Printer.

I

COME TO THE Center, for The Game is on:
Chip; For a Pot is never lost till won
Separate cheerfully; and if you lose,
Smile, for another's just behind this one.

II

Come, take a Hand; Forget your frigid Feet;
There's something doing when the Greeks do meet;
The Game has but a little while to run
And one must sow if he would harvest Wheat.

Typical Holme illustration for George Ade; from the University collection.

A page of text from the Poker Rubaiyat showing a wood-cut initial and the first two quatrains of this colorful book.

A woodcut by Holme from the Poker Rubaiyat, the most ambitious product of the Bandar Log Press. The work contains twelve full-page cuts in nine colors and has long been a collectors' item.

cards at the same time, thus combining business with pleasure."

We shall presume that in 1903 you paid five dollars for this curious little booklet, and so today you have a collector's item worth several times the five dollars you paid for it. The New York World called it "Capital stuff." So it was —and so it still is, a book of quatrains about the game of poker written in the style of the Rubaiyat, with its full-page colored woodcuts

Here end the Poker Rubaiyat made by Kirke La Shelle. The illustrations were made by F. Holme and hacked out by him with a 3-bladed jackknife on poplar lumber carted across-country clear from New York for the purpose. The key-blocks for the initials were made on chalk plates and the whole was made into a book by him at

Phœnix, Arizona. Printing was begun December 1, 1902 and finished January 30, 1903. But 274 copies were printed, all on hand-made paper, after which the types were distributed and the plates and color blocks destroyed. 104 copies are for stockholders of the press and 150 are for sale. This copy is Number 113.

The colophon of the Poker Rubaiyat.

delightfully showing, for instance, the "Bluffer's foolish face," or a player taking more money "from the unwilling vest." Kirk LaShelle wrote the quatrains; Frank Holme produced the woodcuts "hacked out by him with a 3-bladed jackknife on poplar lumber carted across-country clear from New York for the purpose."

Here is the wistful ending of this book for poker-lovers:

"Oh game of my delight that ne'er can wane,
The rattling chips are Music sweet of strain;
How sad to think a Time perforce must come
When Chips and Cards will lure me all in vain.

"Then, as you sit around the Board—alas—
With full intent each other to harass,
Deal out a Hand where I was wont to sit
And whisper when it comes to me 'He'll pass'."

The University of Arizona Library owns a large group of art books from the personal library of Holme, a number of his original drawings, and six of the seven scarce items issued in Arizona by the Bandar Log Press in very limited editions. Three of the little books for the projected series in the "Strenuous Lad's Library" were written by George Ade, burlesque of the then popular dime-novels, and after forty years are still hilarious fun.

In these little yellow-paper-bound booklets, illustrated with Holme's woodcuts, you can follow the surpassing adventures of Clarence Allen, the Hypnotic boy journalist; or Rollo Johnson, the boy inventor; or Handsome Cyril, the Messenger boy with the warm feet. When a beautiful chestnut-haired girl falls into the villain's clutches, Handsome Cyril finds that he is not of the common garden variety of messenger boys. For he can, almost simultaneously, make a courteous bow, come through with a left to the jaw, support a fainting lady, and make his lip curl while the villain curses him.

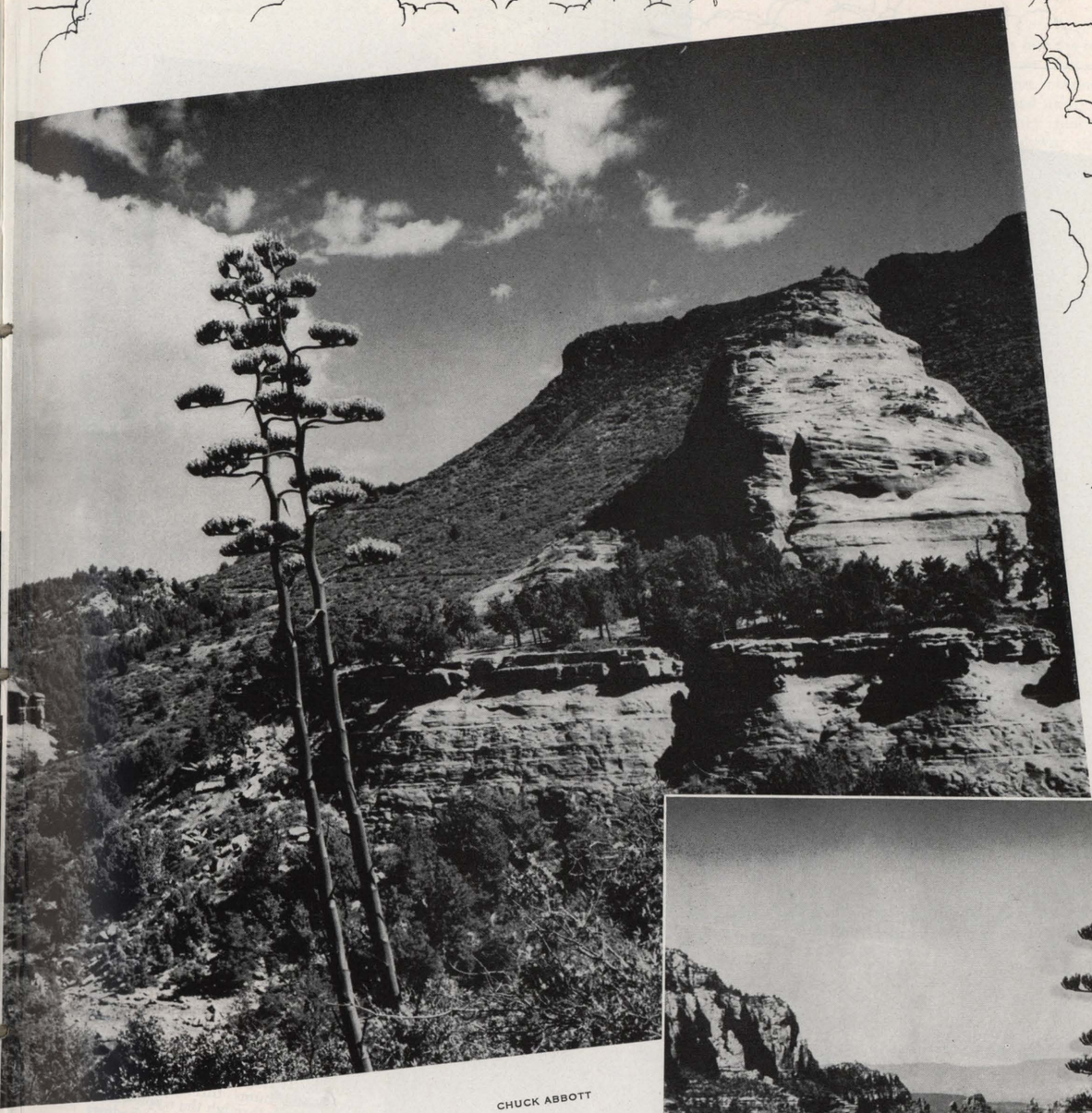
The last item from the Bandar Log Press, in 1903, is an amusing short story of Indian love called "Her Navajo Lover" written by Will Robinson, the first book by this later well-known Arizona author. Again the woodcuts are by Holme, and the book is bound in a paper cover colored in grey, black, and red like a Navajo blanket.

A Snore. A simple sketch like this shows Holme's mastery of line and his quick perception—qualities necessary in the top-flight "Assignment Artists" on yesterday's newspapers.

"It was an early date," says Rudolph Gjelleosness, former University Librarian, "for the establishment of a special press in Arizona, then pioneer territory. Special presses flourish best where there are leisure groups interested in (and having time for) artistic achievement, and resources to promote and encourage creative endeavor."

Holme was a creative artist expressing his personality—a personality which made considerable impression on his contemporaries. One

(Continued on Page Thirty-nine)

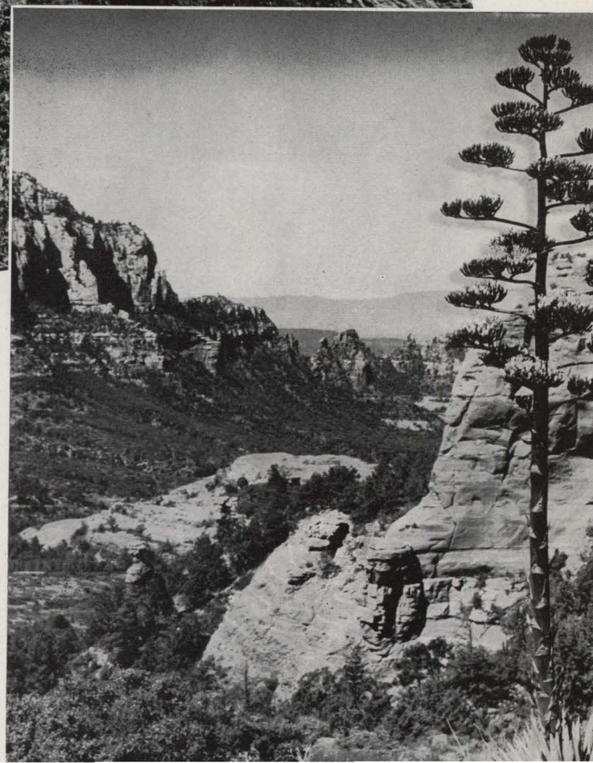


CHUCK ABBOTT

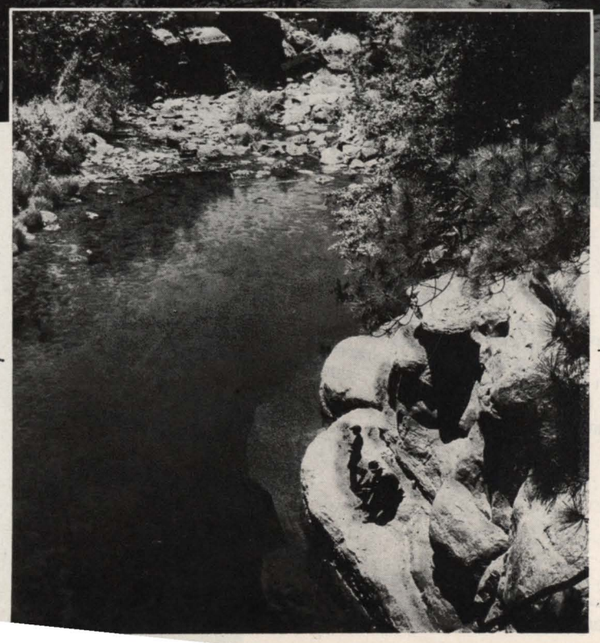
Oak Creek Canyon

CHUCK ABBOTT

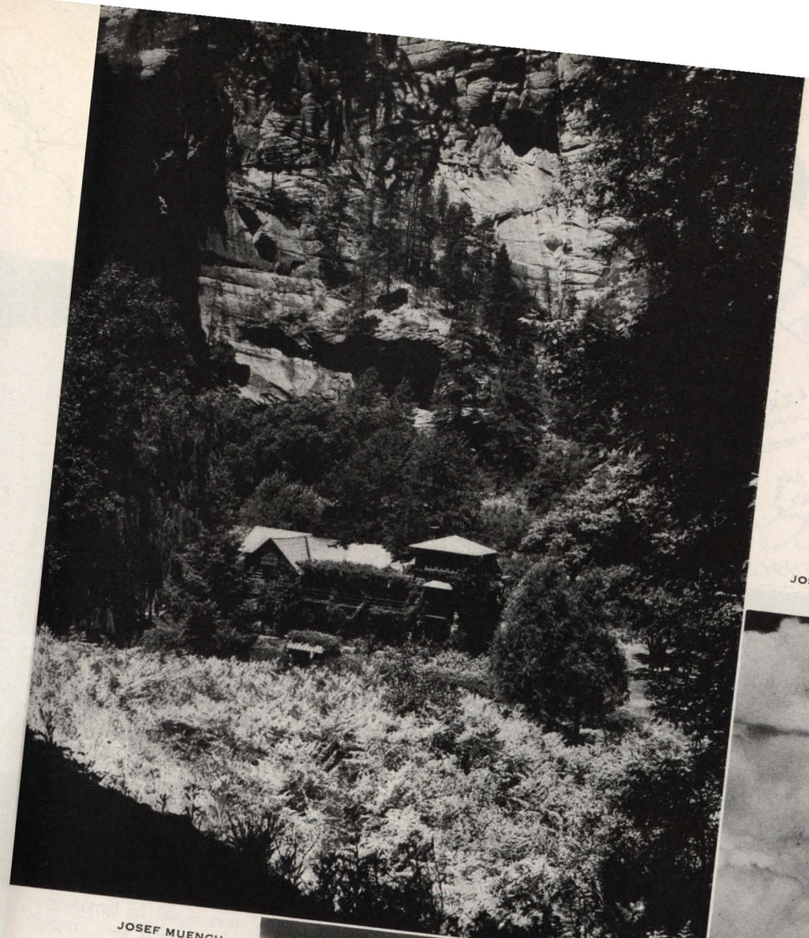
OAK CREEK CANYON, that scenic jewel in north central Arizona, is an enchanted blend of sky, canyon, and cliff. It possesses the charm of the Grand Canyon and Zion as a delicate miniature. It isn't too big to surpass understanding; it isn't too small not to impress one with its ruggedness and grandeur. It is full of delicate color and sky harmonies changing with every season. Its charm is that of the hidden, sequestered places.



CHUCK ABBOTT



Oak Creek, itself, is a sparkling jewel of silver and blue, mumuring quiet music to the ponderous mountainsides along its course. It sings over the white polished rocks and hums through deeper pools. Trout splash through the ripples, hurrying about their business, their shadows enhancing the richness of the setting.



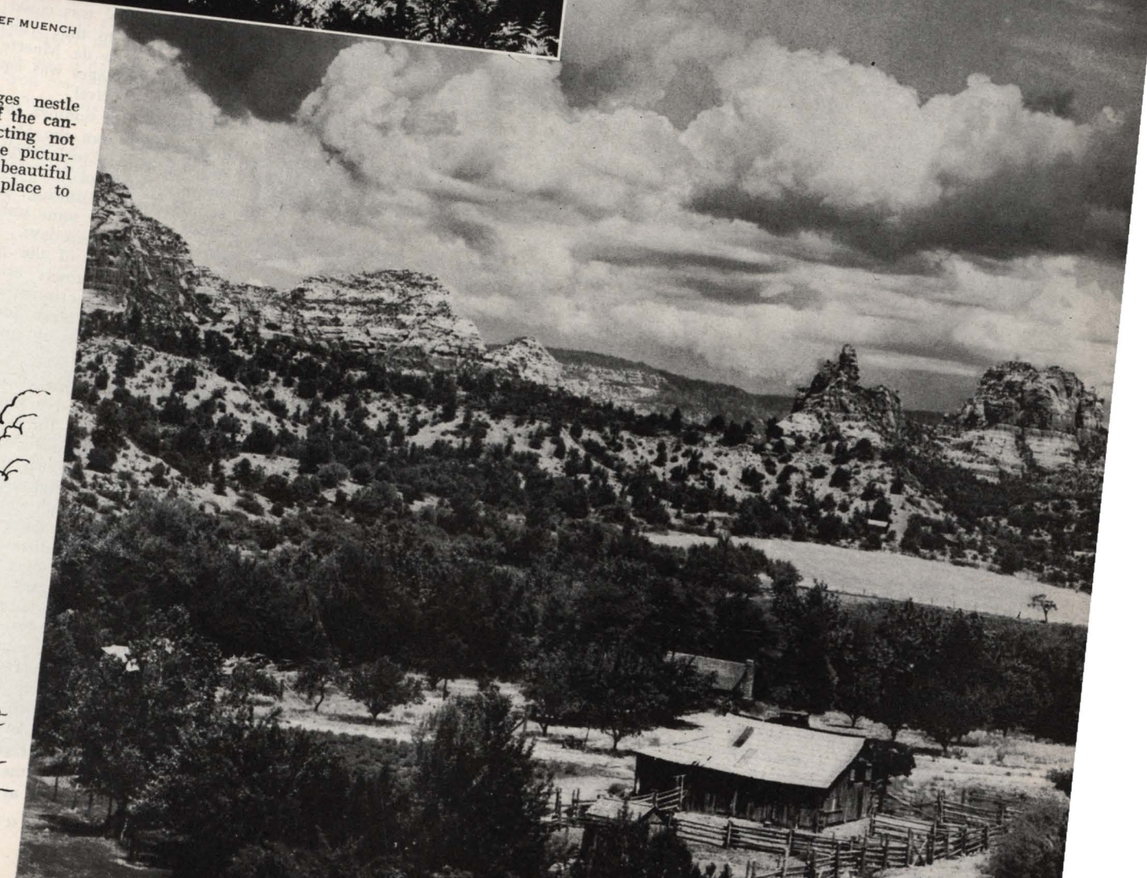
JOSEF MUENCH

Where the canyon opens into the country about Sedona there are farms and ranches. Here sites were chosen both with an eye for beauty and utility. The newcomers in the country find it the perfect place to settle down; the old-timers never leave. When you have been there, you'll know why.

JOSEF MUENCH

JOSEF MUENCH

Cabins and lodges nestle in the richness of the canyon floor, detracting not but adding to the picturesqueness of this beautiful area. This is a place to dream.



El Camino Del Diablo

[THE DEVIL'S HIGHWAY]

Lonely signpost beaten by the sun.

A lonely grave along El Camino del Diablo journey's end for some traveler in the desert

Photography By

BARRY M. GOLDWATER, A.R.P.S.

and

BENJAMIN J. KINSEY

IN THE days when thousands upon thousands of immigrants were pouring into California from the eastern and southern states, from Mexico and foreign countries, in a mad scramble for gold, two roads in the Southwest became historic overland highways. These two roads became notable, not for the sylvan beauty or historic background of the country through which they passed, but for the harsh, barren and waterless wastes which they traversed and for the countless graves that marked their desolate ways. The names of these two dreaded routes of travel were "La Jornada de Muerte" (The Journey of Death) and "El Camino del Diablo" (The Devil's Highway), the first in New Mexico and the second—for the most part—in Arizona.

The extensive plain on the east side of the Rio Grande, between Dona Ana and old Fort Craig was known in pioneer days as "La Jornada de Muerte." It was some 98 miles in extent—a stretch of sandy barren country, almost destitute of water. A trail had been laid across this waste in early Spanish days and many immigrant trains—trying to reach California's golden stream—took this old but dangerous route. As a consequence, it was the scene of many deaths by thirst and hunger, and of many atrocious and sanguinary deeds, perpetrated by the fierce and ruthless Mescalero Apaches, whose hunting grounds were located in that region.

From the high peaks of the Sierra Blanca, which bound the sterile plain on its eastern side, the Mescaleros could easily discern any person or party traveling over its arid waste and adopt such plan of action as would most safely and easily ensure the certain destruction of the lonely traveler or weary, toiling caravan. Those who were able to make their way across this stretch of shifting sand, were so few that, in time, the route became known as "La Jornada de Muerte," on account of the bleaching bones that marked its way.

"El Camino del Diablo" followed along the extreme southern part of present-day Arizona, not far from the international boundary line that now separates Mexico from the United States. This dangerous trail across scorching desert sand is no longer used as a route of travel and many there are among us who never even heard of its uncanny designation. The country traversed by "El Camino del Diablo' was equal in barrenness and desolation to that which was crossed by "La Jornada de Muerte" and danger from hostile savages was equally great on both lines of travel.

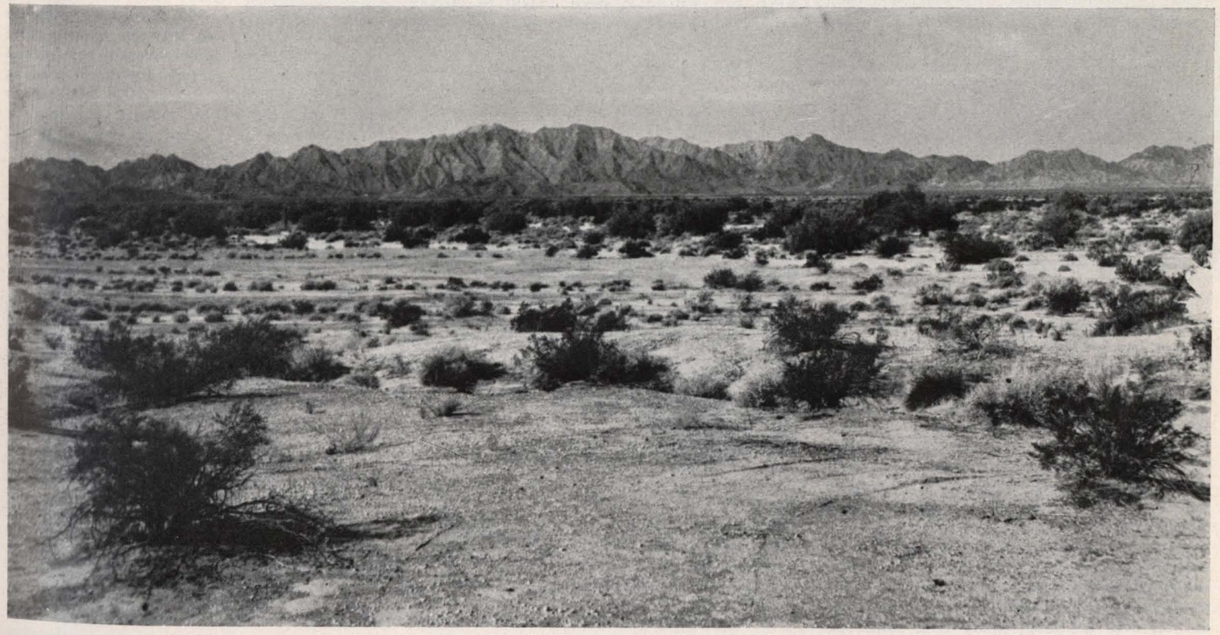
In the heat of summer, the Sonora Desert —over which ran the Devil's Highway— was a gray and melancholy waste—almost entirely bereft of life—a land of silence, solitude and blistering sunshine—a land truly cursed for some unknown reason by the gods of ancient days.

Yet, in spite of the manifold dangers, thousands of miners and adventurers of every kind and description eagerly took their chances along this bleak and dismal trail—all bound for California in quest of wealth and romance.

The "Devil's Highway" of olden days is most excellently described in the following words— "From the junction (of the Gila and Colorado) to Sonoyta, a Mexican and Indian ranchero, or village, situated near the middle of the line (between Nogales and the Colorado), two roads run. The first one, which we will now describe, crosses the desert west of the Sierra del Gila, in a southeast direction, to a pass through one of its ridges leading to water-holes, called by the Mexicans—'Tinajas Altas.' These are natural wells formed in the gullies, or arroyos, on the sides of the mountains, by dams composed of fragments of rocks and sand washed down by heavy rains; they are filled up during the rainy seasons, and frequently furnish travelers with water for many months of the year, being, in fact, their only dependence. There are eight of these tinajas, one above the other, the highest two extremely difficult to reach; as the water is used from the lower ones you ascend to the next higher, passing it down by means of buckets. It is dangerous to attempt the highest, as it requires a skillful climber to ascend the mountain, which is of granitic origin, the rocks smooth and slippery. Although no vegetation marks the place, still it is readily found. The distance to the 'Tinajas' (from the Colorado) is 45 miles over the desert plain already described; the first twelve through the heaviest kind of white sand, and it is next to an impossibility for a train to pass over it, even by doubling teams—twelve mules to each wagon.

"Sixteen miles and a half farther on (from Tinajas Altas) you reach the Tinajas del Tule, situated in the mountains of the same name, called so from the few scattered blades of coarse grass growing in their vicinity. The water here is found in an arroyo, walled in by huge high masses of granite rocks, which present a peculiar appearance, as they lie in smooth whitish lumps huddled together in every possible way. The road winds through the ridges of this sierra for many miles, and then passes over a plain in an easterly course until it turns the southern base of the 'Cerro Salado.' From this point it follows up the valley of a subterraneous creek (at two points of which sweet, or slightly brackish, water can be had by digging), to an Indian village called Quitovaquita, 54 miles from 'Tule.' At Quitovaquita there are fine springs running for the greater part of the year.

"The road continues along the course of the subterranean stream until you reach the Rancho de Sonoyta, thriteen miles and a half farther



The Gila Mountains, harsh and uninviting, glare dully over the desert through which El Camino twists, turns.

A volcano raises its dark head in Lechugvilla desert near Tinajas Atlas.

The desert, bordered by grim ranges. stretches endlessly along with long jumps betwen water.

on. From the junction (of the Gila and Colorado) to within a short distance of this place (Sonoyta)—a heavy road of 130 miles—you look on a desert country. Near Sonoyta it is well covered with mesquite timber; in the valley, to the east of the town, there is some salt grass; but to the west, as far as the Colorado, scarce a blade is to be seen. A dull, wide waste lies before you, interspersed with low sierras and mounds, covered with black igneous rocks. The soil is a mixture of sand and gravel, the reflection from its white surface adding still greater torment to the intense and scorching heat of the sun. Well do I recollect the ride from Fort Yuma to Sonoyta and back, in the middle of August, 1855. It was the most tiresome I have ever experienced. Imagination cannot picture a more dreary, sterile country, and we named it the "Mal Pais." The burnt—lime-like appearance of the soil is ever before you; the very stones look like the scoriat of a furnace! there is no grass, and but a sickly vegetation, more unpleasant to the sight than the barren earth itself; scarce an animal to be seen—not even the coyote or the hare to attract the attention, and, save the lizard and the horned toad, naught to give life and animation to this region. The eye may watch in vain for the flight of a bird; to add to all is the knowledge that there is not one drop of water to be depended upon from the Sonoyta to the Colorado or Gila. All traces of the road are sometimes erased by the high winds sweeping the unstable soil before them, but death has strewn a continuous line of bleached bones and withered carcasses of horses and cattle, as mounments to mark the way.

"Although I traveled over it (the Devil's Highway) with only four men in the most favorable time, during the rainy season of Sonora, our animals well rested and in good condition, still it was a difficult undertaking. On our return to the post (Fort Yuma) from Sonoyta, we met many emigrants returning from California, men and animals suffering from scarcity of water. Some men had died from thirst and others were nearly exhausted. Among those we passed between the Colorado and the 'Tinajas Altas,' was a party composed of one woman and three men, on foot, a packhorse in wretched condition carrying all their belongings. The men had given up from pure exhaustion and laid down to die; but the woman animated by love and sympathy, had plodded on over the long, sandy road until she reached water, then clambering up the side of the mountain to the highest tinaja, she filled her "bota" (a sort of leather flask), and scarcely stopping to take rest, started back to resuscitate her dying companions. When we met them, she was striding along in advance of the men, animating them by her example."

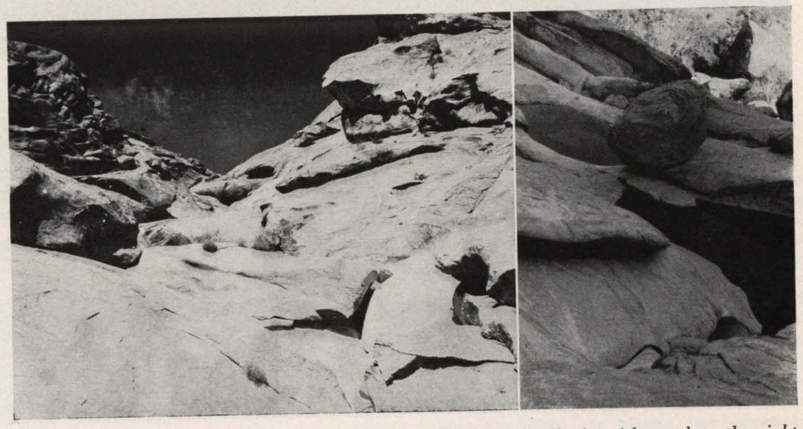
The most important stopping place on the "Camino del Diablo" was known as "Tinajas Altas" (High Tanks), where water was almost always available. Around this spot were woven most of the tales and legends of the Devil's Highway. These natural tanks or basins are situated in a narrow, rocky gorge, and were carved out of solid rock by the action of falling water which, during untold eons of time, has come tumbling down from a height of several hundred feet. The tanks when full will hold from 15,000 to 20,000 gallons of water and consist of a series of seven large basins and a number of smaller ones. With the exception of the lowest tank, which can be approached by animals, they are somewhat difficult of access. The second, third and fourth tanks, although not far up the narrow canyon, can only be reached after a hard climb over steep, water-worn rocks, while the upper ones are only accessible after a difficult and hazardous ascent of several hundred feet.

This water supply became very uncertain, however, when the road was heavily traveled —as was the case during the gold rush to California in the 50's and to the Colorado River diggings in the 60's—and many deaths from thirst occurred at Tinajas Altas. And it was during these gold excitements that the death-roll of "El Camino del Diablo" became most appalling. That roll will never be written in full, since most of the unfortunate victims left no records behind—no indications of who they were or whence they came—nothing but bleaching bones, slowly moldering to dust.

During the few years that this road was heavily traveled, over 400 persons were said to have perished of thirst between Sonoyta and the Colorado River, a terrible toll of human lives even for such a dangerous desert road as the Devil's Highway; and its bleak and barren course was marked by forlorn and solitary graves, each with its cruciform heap of stones to mark the place of burial.

A traveler over the Camino del Diablo once said that in a single day's ride—of a little over 30 miles—he counted 65 graves by the roadside and that in one an entire family had been buried. The horses of this ill-fated group had given out and, being unable to cross the scorching desert on foot, all perished together of thirst. Their bodies were found—months later—by other more fortunate travelers and buried in one large sepulcher, which was covered with a cross of stones and a large circle of the same material. The carcasses of their horses and the wreckage of their wagon and belongings marked, for many years, the place of their death.

On a bluff—just to the east of Tinajas Altas —there is an old burial ground which, in early days, contained some 50 graves. These sepulchers were covered by stones—laid on the ground in the form of a cross—and marked the last resting places of those who reached the "tinajas" to find the lower tanks dry and themselves too weak to climb to the ones above. Here they laid down to die and those who followed gave them decent burial. But scores of others became lost in the wilderness of sand or succumbed to Apache treachery and left only their bleaching bones to tell the story of their adventure.

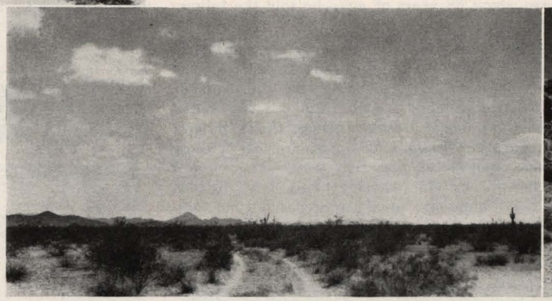


Another view of Tinajas Altas and to the right one of the largest pools. Can hold 4,500 gallons.

Natural basins in the Tinajas Altas catch rainwater and hold it for the benefit of the parched wayfarer.

Tinajas Altas rising in solid stone out of the desert, have saved many lives.

A portion of the old Camino del Diablo across the Tule desert.



The Tule Tanks treasure another of the scarce water supplies found along El Camino del Diablo.

Many years ago, the Papago and other Indian tribes were accustomed to camp at "Las Tinajas Altas" for the purpose of hunting "big horns" or mountain sheep, which then, as now, are the principal occupants of these forsaken and unhabited areas. In the vicinity of the tanks could be seen the remains of these Indian hunting camps, around which were strewn the horns of the animals they killed. These mountain sheep—one of the most interesting of Arizona's wild animals—are protected by nature in their desolate retreats, because hunters, fearing the waterless wastes, seldom dare to follow them into their desert feeding grounds.

That death still hovers over the region across which ran the Devil's Highway, was proved during the past summer, when seven out of a party of nine persons died from thirst upon the hot desert sands of northwest Sonora. Starting from Santa Ana, about 75 miles below Nogales, this ill-fated party was on its way to Brawley, California, in order to save time and distance, took a little used road, which no one is advised to take without an extra supply of water, food and fuel. It was midsummer and the heat in that desert country was intense. Seven members of the party had succumbed to heat and thirst, when, by chance, an intinerant peddler—taking the same little-traveled road—came upon the scene of death and distress.

On August 5, 1941, the following statement was sent from Yuma to the press of the state:

"The Devil's Highway—"El Camino del Diablo"—across the Sonora, Mexican desert added seven persons—five of them members of a California family—to its list of victims today,.

T. H. Newman, sheriff, said the seven died from thirst and heat after their truck became stalled in sand 17 miles east of San Luis, Sonora, below the border from Yuma.

"Two survivors of the ordeal were brought to a hospital here. The condition of one was still critical.

"Newman said Mexican officials estimated the party had been stranded four or five days without food or water.

"Elias Cornejo had gone for help. His naked body was found five miles away. Rafael Cornejo, dispairing of his life and unwilling to suffer longer, wrote a note giving details of his destination and identification, then slashed his throat. Another member of the party, Newman said, slashed his wrists.

"The road is an old stage coach route which skirts the United States border from Santa Ana to Tia Juana, in northwestern Sonora."

By Tinajas Altas and Sonoyta passed the ill-fated Crabb filibustering expedition on their way to Caborca, Sonora, where they were later annihilated as invaders of the country. By the same route also went the notorious Bell Gang, which, for a time, terrorized California soon after the discovery of gold. This band of ruffians entered Sonora and proceeded to commit even more heinous crimes than in California, until driven out of the state by the outraged Sonorans.

Raphael Pumpelly in his book—"Across Asia and America"—thus describes the famous Tinajas Altas in 1862.

"We were approaching the Tinajas Altas, the only spot where, for a distance of nearly 120 miles, water might at times be found.

"It was a brilliant moonlit night. On our left rose a lofty sierra, its fantastic sculpturing weird even in the moonlight. Suddenly we saw strange forms indefinable in the distance. As we came nearer our horses became uneasy, and we saw before us animals standing on each side of, and facing the trail. It was a long avenue between rows of mummified cattle, horses and sheep.

"Nothing could be more weird. The pack animals bolted, and Poston and I rode through with difficulty.

"Ten or twelve years before, during the time when meat was worth in California almost its weight in gold dust, it paid to take the risk of losing on this desert nearly all of a herd, if a few survived.

"If no water was found at the Tinajas Altas

most or all of the animals, and some of the men, were sure to die.

"In the intensely dry and pure air there was no decomposition; all the dead simply became mummies.

"This weird avenue had been made by some travelers with a sense of humor, and with a fertile imagination which had not been deadened by thirst.

"Our next camp was made at the Tinajas Altas or high tanks. Here, in a steep ravine in the mountains, there is a series of five or six large pot holes, one above the other, gouged in the granite bed of the gorge. This gorge was apparently the outlet onto the desert of a system of drainage of the sierra. It had been carved either by erosion in a long past period of a different climate, or by occasional cloud bursts happening through some scores of milleniums. After a rain these holes are all filled, but as the season advances the lower ones become empty, and the traveler is obliged to climb to the higher tanks and bail water into the one below him, and from this into the next, and so on until there is enough in the lowest to quench the thirst of his animals. The higher tanks are accessible only at risk to life. After a succession of dry seasons it sometimes happened that travelers arrived here already dying from thirst. Finding no water in the lower holes, they climbed in vain to the higher one where, perhaps exhausted, they fell from the narrow ledge, and the tanks in which they sought life became their graves."

Although "Las Tinajas Altas" are still little known on account of their isolated location, yet it is very interesting to note that they are shown on the map made by Father Kino, the Jesuit missionary, of the region around the Gila and the Gulf of California, as the result

Even on the Sonora-Arizona desert highway markers are found to guide the traveler.

of his travels and explorations from 1698 to 1701. He was probably the first white man—under Indian guidance—to view the "tinajas" and the surrounding Sonora desert.

During his life-long residence in Arizona, the writer was able to interview only one person—Don Francisco Salazar, once a prosperous planter and merchant of Hermosillo, Mexico—who had ever crossed the Sonora Desert by way of the "Camino del Diablo" and lived to tell the tale. Don Francisco journeyed over the dreaded Devil's Highway—not only once but twice—reaching his destination safely each time. Twenty years or more ago—when the was about 88 years of age—he told the following story:

"Si, senor, when I was a young man—full of the spirit of adventure—I traveled over the terrible Camino del Diablo, the old trail or road from Sonora to California. It was called the Camino del Diablo, because thirst, hunger and Apache Indians took a fearful toll of those who chanced to pass that way. The victims who fell by the wayside along that dreaded desert highway, died unprepared and unshrived, without the comfort of priestly admonition, and so, perhaps, did not reach the gates of heaven '¿Quien puede decir?' Anyway, this deadly trail became known as 'El Camino del Diablo' (The Devil's Highway), a fitting and appropriate title.

"As I said before, señor, I was born in the state of Sonora, Mexico, on September 10, 1832. When 17 years of age, I joined a party of about twenty persons—most of them from Sonora—who were preparing to start for the goldfields of California. I was the youngest member of the party and I induced half a dozen other young fellows to join the expedition, one of them—Miguel Costello—becoming my partner—in our adventure. There were eight or nine married men and our guide was Don Alejandro Cordova, who had already made a journey to California over the Camino del Diablo and had returned to Mexico by water, landing at the port of Guaymas. From there, he had journeyed overland to Sonora, where he agreed to become our guide to the sunny, golden land of California.

"We started on our journey in the spring of 1850, soon after the news of the gold discovery reached Sonora. We took the regular road to California—by Sonoyta, San Domingo, Quito-va-quita, to the south of the Sierra Salada, to Tinajas del Tule and then over the Tule Desert ot the Tinajas Altas (High Tanks), an important stopping place on the road to California; from the Tinajas, we followed the real Camino del Diablo for miles and miles across the Sonora Desert to the Colorado River. This stretch of desert is the most dreary and desolate that can possibly be imagined, a sandy, waterless waste—50 miles across—into which hardly a living thing ever ventures."

"Some 20 miles to the west of the Tinajas was a permanent landmark called 'Las Cuevitas' (little caves), in some rough, volcanic knolls to the south of the road, which at this point went through a pass between 'Las Cuevitas' and the Sierra del Gila.

"We were pretty well equipped for the long and dangerous trek, having burros and small Mexican mules for pack animals and being well-armed to resist (if necessary) Indian attacks. For food, we carried large quantities of carne seca (sun-dried beef), pinole (parched corn or wheat ground to a very fine meal) and panocha (a sweet product made from sugar cane).

Our water-bags—absolute necessities on such a trip—were made of 'vaqueta' (leather), well smeared on the outside with tallow and then covered with a woven mat of grass. They were slung across the back of the pack animals, one half of the bag handing on each side. These water-bags were then (and yet are) made by the Indians of Mexico.

"Not all of us had horses to ride, but those who did, had very good animals. My own horse was an excellent steed, large, strong and dependable. Each member of the party carried 'dos pistolas' (two pistols), a 'carabina' (shotgun), and a 'bota de vaqueta' (a sort of leather canteen for carrying water for individual use).

"We had to travel at night for fear of the Apache and concealed ourselves and stock during the day. We had selected the spring time to make our journey, during the fall and winter months, was the most dangerous period to travel over the Camino del Diablo. At that time of the year, the Apache were most active in their raids and attacks. By then the farmers in the rancherias and pueblitos of northern Sonora had gathered their crops of grain and corn and stock in general was fat and in good condition. That was raiding time for the Apache and they swarmed along the trails and roads and in the vicinity of water-holes and small communities, and we selected the nighttime in which to move along the dangerous trail, as Apache seldom attacked after dark.

"Many people—especially 'los Americanos'—thought that the winter months were the best for traveling over the Sonora Desert, but the danger from blood-thirsty savages was then very great. In the summer-time, the Apache were inclined to remain in their mountain haunts and but infrequently visited the hot desert country, which could furnish but little comfort or sustenance.

"Our journey as far as Sonoyta was without incident, except that we always had to be on the lookout for Apache. Between Sonoyta and Tinajas Altas—a distance of some 80 miles—there was only one place—Las Tinajas del Tule—at which water could be obtained, and, between the Tinajas Altas and the Colorado, there was absolutely no water of any kind.

"When nearing Tinajas Altas, we camped in a secluded spot some distance from the tanks, fearing an Indian ambush. We then drew lots for the purpose of selecting three men who were to go after water; it fell to my lot to be one of that group. Water was not plentiful at the Tinajas and we had a great deal of difficulty in getting sufficient for our needs. We would first bring water for the stock and then for our own use. All these activities had to be performed after night-fall under the supervision of our guide.

"Travelers had to be careful in approaching the few water-holes along the road, as they were favorite places of ambush for hostile Indians. At Tinajas Altas—in the old days—Apache were always skulking in the nearby hills and arroyos, ready to pounce upon weary or weakened parties or some careless and unwary traveler. The Indians—sneaking from place to place—would signal each other by imitating the cry or call of various wild birds and animals, such as the owl, crow, coyote, etc. At times—around the tanks—these calls could be heard continually, giving to the surroundings a weird and unearthly setting, as if the evil spirits of countless generations were hovering about the place.

"The immediate area around the Tinajas was a vast graveyard of unknown dead and the road from there to the Colorado was marked the whole way by the dried carcasses of mules, horses and cattle and the scattered bones of human beings, slowly turning into dust. In such a region but little time can be given to conventional things and the dead were left where they fell to be sepulchred (if at all) by the fearful sand storms that sweep at times over the desolate waste.

"We started from the Tinajas with as full a supply of water as we could carry and managed to reach the Colorado River without serious mishap. (We hurried over this part of the desert as fast as we could and did not dare make a fire while crossing for fear of the Indians and so had to eat our meals cold. We struck the Colorado some miles below its junction—and camped on the California side for a short time to recuperate. We were then among the Yuma Indians but they caused us no trouble. As a rule the Indian tribes of the Southwest were more unfriendly to the whites than they were to the Mexicans. There was much in common between the Indians and the Mexicans (the latter all having some Indian strain) but nothing at all between the whites and the Indians. We continued our way into California and in the month of September, 1850, reached Placerville (first called Hangtown), where much placer gold was still being taken out.

"We stayed in the Placerville country for about a year. Then some of our party, especially the married men who had left their families behind, began to talk about going back. I had done well financially and decided to join them. After counting noses, however, it was discovered that only eight of the original party were ready to return, the others electing to remain and grow up with the country. At that time, the finest farming land could be had for little or nothing in California. Among those to remain was my partner, Miguel, whom I never saw or heard of again. Other additions to the party, however, made it strong enough to undertake the journey.

"Finally, we started out on the return trip, well supplied with food, well mounted, and well armed for defense against the Indians. I left Placerville with about $50,000 in gold and others in the party had varying amounts—some as little as $2,000. Fortune is fickle, señor, and in gold fields, all did not fare the same. We returned by way of Los Angeles, then a small Mexican community, with the customary display of drinking, gambling and fandango resorts. Here, being young, I lost some of the gold that I had gathered at Placerville.

"After a while, we left Los Angeles for the Colorado River which we reached without adventure. We crossed that stream and, for the second time began the hard and dangerous trip across the bleak and barren Sonora Desert. One afternoon—when we had gone about two thirds of the way from the Colorado to Tinajas Altas—we saw a band of Apache riding along some hills quite a long distance away. We immediately concealed ourselves as best we could and remained there that night and the following day; when it became dark, we started again for the Tinajas, where we arrived in safety. Eventually we reached our homes in Sonora, where, I bought a sugar plantation, married, and settled down—Gracias a Dios!"

Such was the plain, unvarnished tale of Don Francisco—now retold in English by the writer.

Present-day travelers throughout the Southwest, as their shining cars roll along smooth and faultlessly maintained highways, give but little thought to those other days when long trains of covered wagons swayed and creaked along rough and boulder-strewn roads that were, in reality, little more than trails; while all along the way, hostile savages—who lived by murder and pillage—menaced them at every turn. Months of weary and dangerous travel were necessary to reach California from the eastern and southern states and from the northern part of Mexico. But, today, speeding automobiles will cover in a few hours the distance that it took the builders of the West months and months to traverse. Such is the visible progress that modern transportation has made.

Another grave along El Camino del Diablo, silent testimony to the dangers of the desert.

Tule Wells, as it was before, as it is today. The Department of Interior has erected a windmill.

The Cabeza Prieta Mountains stick jagged points against the sky to form a landmark along El Camino.

MONUMENT IN THE MOUNTAIN

The Chiricahua is a study in rocks and history

BY NATT N. DODGE

Photos By National Park Service

Directional sign at entrance to Bonita Canyon, Chiricahua National Monument, near Douglas, Arizona.

IT'S JUST A SHORT hop from El Paso to Tucson in one of the great, silvery airliners which wing steadily across the Southwest. Hidden in this broad lumbar region of North America, its spine, the Continental Divide, remains unnoticed, even from the air. But just to the west, beyond the Arizona-New Mexico line, the rugged Chiricahua Mountain Range, sprawling toward Mexico, lifts itself suddenly out of the desert.

Like claws sheathed in the green velvet of pine, juniper, and manzanita; pinnacles, turrets, and spires of dark grey rock reach up toward the startled passengers gazing down upon the bastions of the Range rising sharply beneath them. As the ship sweeps in, crosses the summit, and drones westward, an amazing panorama is spread out below for a few exciting minutes; a panorama of deep canyons and sharp ridges lined and studded with a spectacular array of immense perpendicular rock figures among which the clamor of the plane's motors echoes and reverberates.. It is this strange galaxy of nature-carved images covering 17 square miles of canyon, cliff, and crest that has been reserved under perpetual protection as Chiricahua National Monument.

As the big transport roars westward, a group of riders on a broad trail winding among the rocks of Rhyolite Canyon below rein in their horses to watch the modern plane flashing overhead; a sight which seems strangely incongruous as if an intruder from another world. Relaxing beneath the benign influence of the quiet surroundings, the pattern of sun and shadow on the trail where it passes beneath the low-hanging branches of Chiricahua Pine, Emory Oak, or Arizona Cypress, and the unhurried gait of their mounts, they have forgotten, for the moment, the war and the myriad of worries and problems of daily life.

Puzzled and astonished by the multiplicity and variety of the rock pillars and spires, they have listened with absorbed interest to their guide's explanation of the forces of nature which have been at work for hundreds of thousands of years preparing the material and sculpturing the amazing figures which surround them and which line the canyon wall as far as they can see. They have noticed strange flowers and have been surprised to learn that, isolated from other ranges as they are by the surrounding plains, the Chiricahua Mountains contain an astonishing number and variety of plants. They have been reminded that here, in these rugged canyons, the famous Chiricahua Apache warchiefs, Cochise, Geronimo, and others, led their tribesmen into Corregidorian retreats so inaccessible and so well defended that it took the power of the United States army many years to dislodge them.

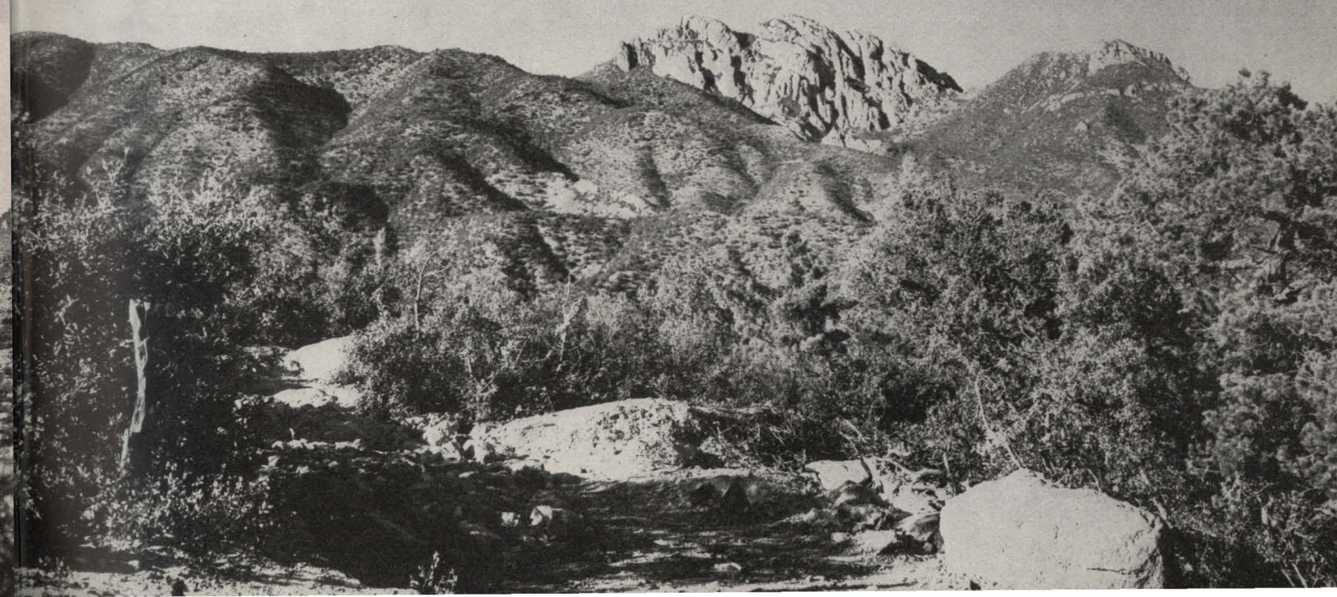
Today, only the occasional full-throated roar of airplane motors breaks the peace and quiet of a rugged terrain which once resounded to bursts of rifle fire and the sharp commands of cavalry officers. But the violence of Indian warfare was as nothing in comparison with the convulsions of nature which took place here in ancient Tertiary times. The region, then, according to geologists, was relatively level, perhaps sloping slightly to the west. Suddenly all Hell broke loose and, accompanied by violent earthquakes, molten lava burst through the crust of the earth and spread over the plain. From some of the vents, cinders and volcanic ash were blown into the sky to fall as a |blanket over the hardened lava crust. Eruption followed eruption, occasionally in close succession, again with centuries intervening. Some of the lavas cooled at a rate to cause vertical shrinkage cracks to form in regular patterns throughout the solidifying mass. Many of the rhyolitic lava blankets were relatively thin and small in extent, others widespread and many feet in thickness.

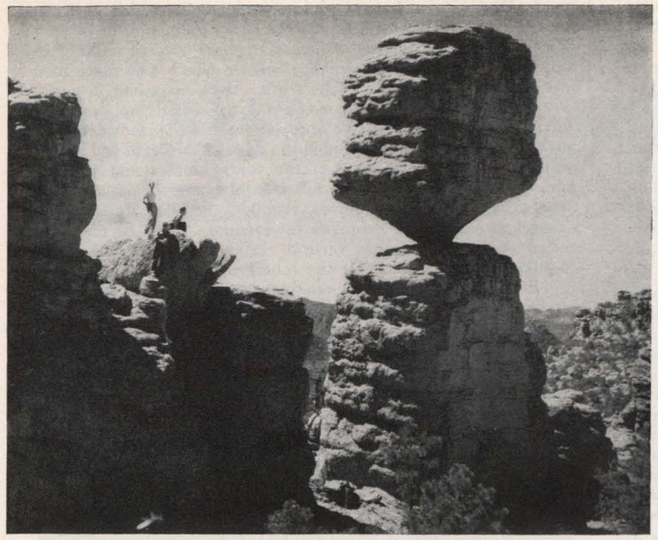
Gradually the eruptions became less violent and finally ceased. leaving a great volcanic field made up of layered lavas differing in extent, thickness, and in the composition of the materials of which they were made. But Nature still was not content with the desolation she had created. Gargantuan stresses and strains developed in the earth's crust, the resulting tortuous movements slowly lifting and tilting great lava-capped blocks to form mountains. In this tremendous terrestial labor, the Chiricahua Range was born.

The old adage, "All that goes up comes down," applies to mountains, too; and no sooner had the range taken shape than the agencies of erosion began their slow but endless process of wearing it away. Rain and snow beat upon the rocks; running water, tooled with particles of stone, chiseled loose by freezing and thawing, scratched and abraded the surface everywhere; soil formed, accumulated in pockets, and plants gained a foothold. Erosion bit deeply along the shrinkage cracks made when the lavas had cooled; and horizontal planes, which once had been the surfaces of successive lava flows, proved especially susceptible to the solvent action of water. As Time spun its century hand again and again around the face of the geologic clock, cracks were widened to fissures, fissures were enlarged to breaches, some of the breaches

Above a green blanket of oak and manzanita chaparral, Cochise Head may be seen from all parts of the monument.

Visitors enter Chiricahua National Monument via the broad, forested mouth of Bonita Canyon. Sugar Loaf Mountain is at left, highest point in the monument.





Big Balanced Rock is the objective of many hiking and horseback parties.

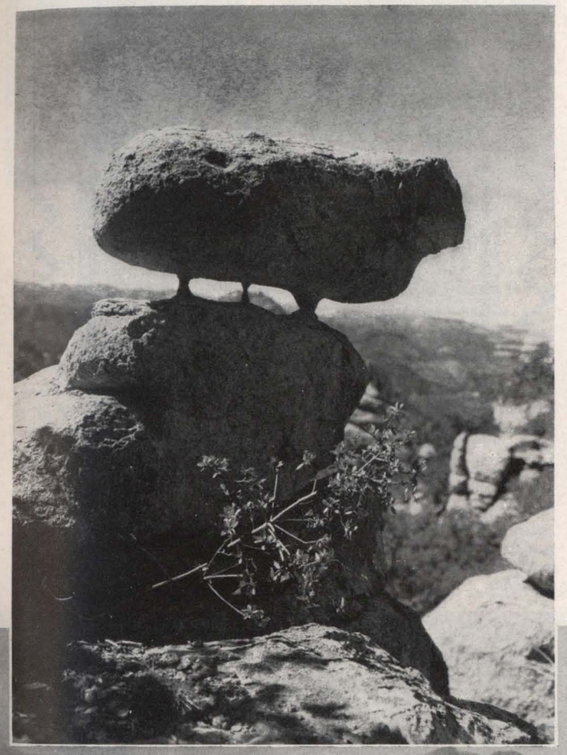
became gullies, and a few of the gullies grew to be canyons. Along these canyon walls, erosion has continued its attack and is still busily engaged in its ceaseless task of carving what remains of the ancient rhyolite beds into columns, pillars, and spires; the rough blocks which the more delicate hands of wind, sun, and rain are sculpturing into the weird forms of the immediate future. Some of these forms the imagination of man will christen with popular names, and photographers will submit their images on paper to editors to illustrate the magazine articles of tomorrow. Today and for centuries to come, Chiricahua National Monument will exhibit all stages of erosional activity in the rhyolitic lavas, from the talus remains of a collapsed pinnacle to the sheer cliffs where the fingers of time and frost are plucking at fresh cracks and crevices.

In addition to the spectacular balanced rocks and weather-worn figures, and the scenic attractions of cliff and canyon, erosion has laid bare a variety of records of the turbulent past. Exposed beds of volcanic ash are mute reminders of violent eruptions of long ago, while a trailside ledge of peculiar, spherical pellets locally called "petrified grapes" present testimony whose geological evidence has not yet been satisfactorily interpreted. At one point along the Bonita Canyon Highway, red shale deposits mark the spot where upwelling lava once blocked an ancient stream channel, deposits of silt in the resulting impounded waters forming shale beds of today. Later infiltrations deposited gypsum producing a network of white veins. At other places, erosion has uncovered contact belts between extruded lavas and sedimentary rocks resulting in metamorphized zones and, in some cases, deposits of metal ores.

When Tertiary disturbances buckled the earth's crust to form the Chiricahua Mountains, Nature's selection of a location placed this chain at some distance from other ranges; a mountain island in a desert sea. During the centuries which have intervened, plants gradually gained a foothold and provided vegetative cover for the slopes. Exposure, slopes, type of soil, elevation, moisture, and other conditions combined to provide a great variety of habitats which were occupied, as time passed, by plants whose seeds were brought in by the wind and other agencies, and could survive under the conditions they encountered. Because the range was relatively isolated, certain plants common to similar locations elsewhere apparently never found their way into the Chiricahuas, while others, in passing through thousands of generations, have undergone evolutionary changes making them different from their relatives in other places. The similar gradual establishment of an animal population also has resulted in the presence of certain forms unique to the area. These "different" plants and animals of which the Chiricahua Red Squirrel is noteworthy, are referred to by scientists as products of isolation. On the other hand, the Chiricahuas are occasionally visited by wanderers among birds and mammals from distant, although similar, mountain ranges to the southward. These zoological vacationists, of which the Thickbilled Parrot, Coppery-tailed Trogon, and Mexican Jaguar are the most notable examples, are classed as "invasion" forms.

Although the unusual creatures of any area are given the spotlight of publicity, there are many common varieties of birds and mammals in Chiricahua National Monument which are more or less in evidence. Band-tailed Pigeons nest throughout the area; three varieties of jays are both seen and heard; nuthatches, warblers, towhees, grosbeaks, woodpeckers, flycatchers, tanagers, swallows, swifts, and many others are abundant. Such varieties as orioles, the Painted Redstart, and Vermilion Flycatcher make brilliant flashes of color among the greenery of canyon bottoms, while monument birds range in size from the tiny humming bird and bush-tit to the great Golden Eagle.

Constant protection, a privilege accorded all wild creatures in every national park and monument, is showing its influence at Chiricahua, especially among the Arizona White-tailed Deer which are becoming quite unafraid and are frequently seen by visitors along the highway in Bonita Canyon. Occasionally the tracks of a bear, cougar, or wild turkey are found. Smaller animals, especially the rodents, are common. These include squirrels, chipmunks, wood rats and kangaroo rats, rabbits, skunks, badgers, coyotes, and foxes.

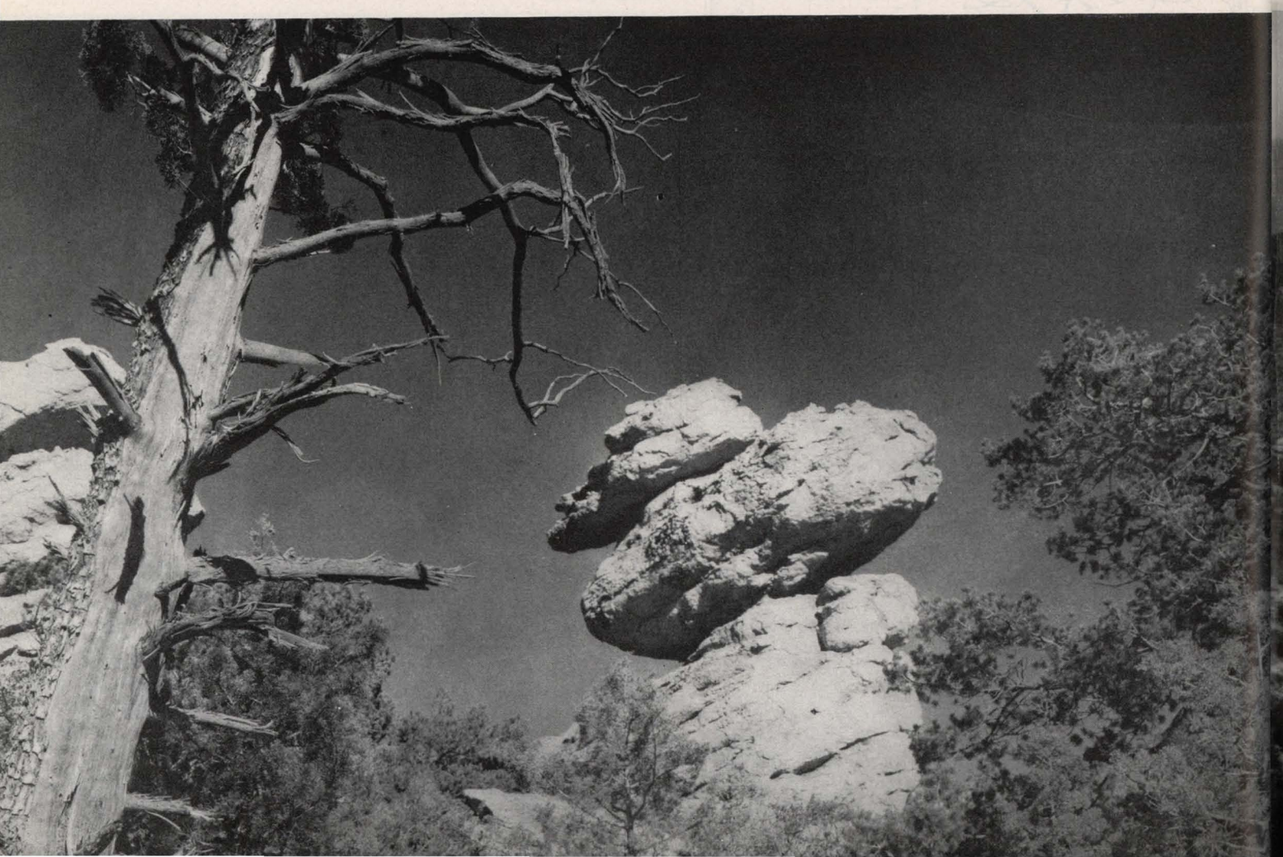


"The Sheep" is one of the most spectacular rock figures of the monument.

Frank Fish, custodian of Chiricahua National Monument since 1936, is National Park Service representative for the reserve.

"The Duck" or "Duck-on-a-Rock," one of the well known figures in the Heart-of-Rocks section.

From Heart-of-Rocks, the visitor is amazed by the spectacle before him.



Geronimo, notorious Apache renegade, 1882.

Because, then, of its great diversification of habitat from open, sun-drenched slopes and chaparral-covered ridges to tree-choked canyon bottoms with spring-fed pools, and from valley floors at an elevation of 5,300 feet to densly forested mountain peaks 7,300 feet above the sea, Chiricahua National Monument offers an enormous variety of plant and animal life. This assortment is augmented by the rare forms which are present because of the operation of natural factors governing isolation and invasion.

Preliminary plant collections for the monument herbarium made, principally, during portions of two summers, total 507 different species representing 80 botanical families. Interesting examples include the fern group with 14 representatives, the conifers with nine species, five of which are pines, and the oaks with seven different varieties. One botanical authority has stated that Chiricahua National Monument contains a greater range of plant life than any area of equal size in the country. Be that as it may, the pleasant all-year climate, wealth of plant and animal life, and the weird, spectacular rock formations all made readily accessible by seven miles of well-kept mountain road and 14 miles of graded trails makes Chiricahua National Monument a refreshing interlude in the journey of tourists traveling the highways or railways of southern Arizona.

From a transcontinental air liner, the passenger gets only an intriguing glimpse of a great jumble of picturesque rocks. The motorist who follows Bonita Canyon Highway to Massai Point

Nachez, son of Cochise, was a friend of the whites.

This white-tailed fawn is curious but not alarmed by the camera man. *A. A. Nichol*

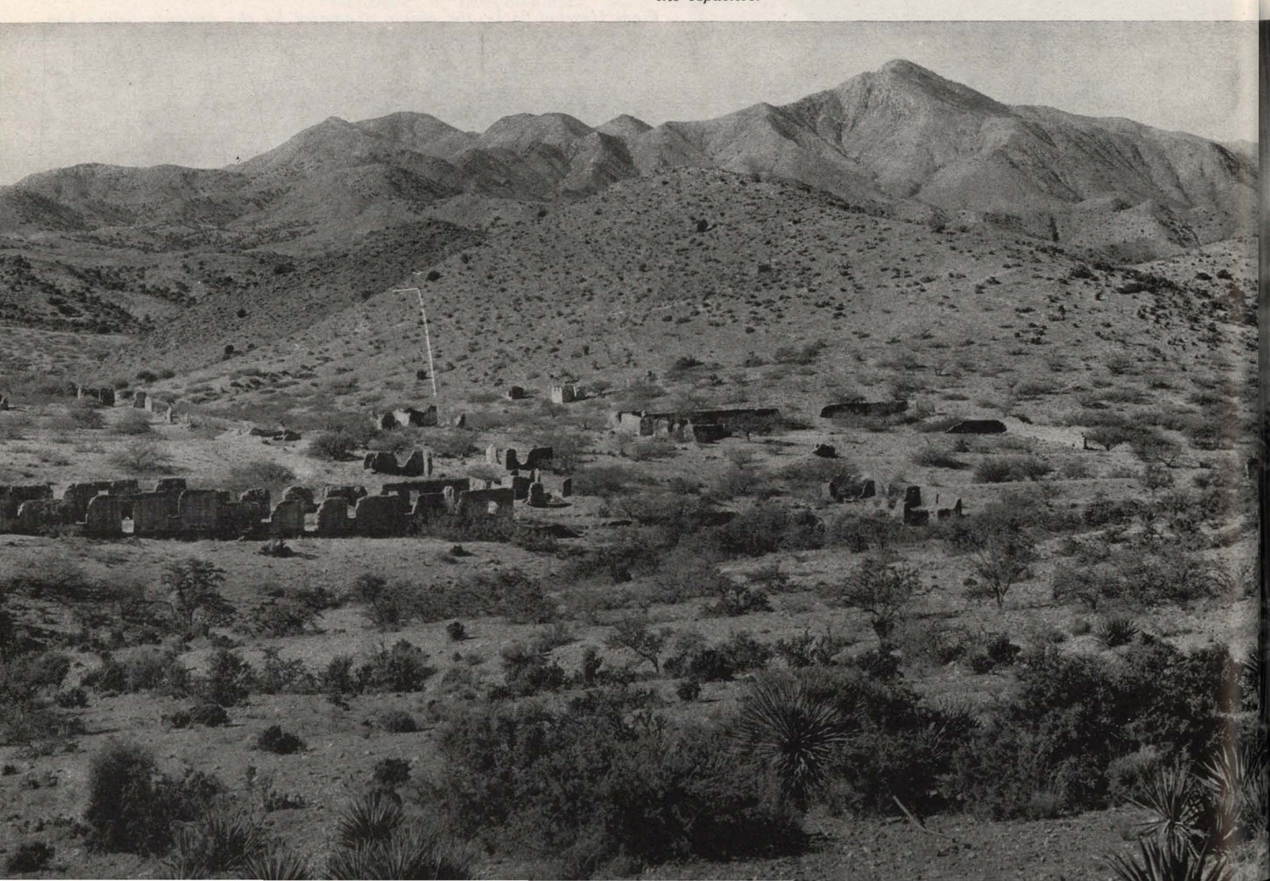
is impressed with the marked differences in vegetation between hillside, canyon bottom, and mountain crest. From Massai Point Overlook, he has a fine view out over the massed spires and pinnacles stippling the divides between the major canyons of the monument. From the vantage point of the Orientation Station, he is inspired by the wide panorama to the east over the San Simon Valley into New Mexico; and to the west over the Sulphur Springs Valley guarded by the twin knobs of Dos Cabezas Peak. Northward, the clear-cut profile of Cochise Head dominates the skyline.

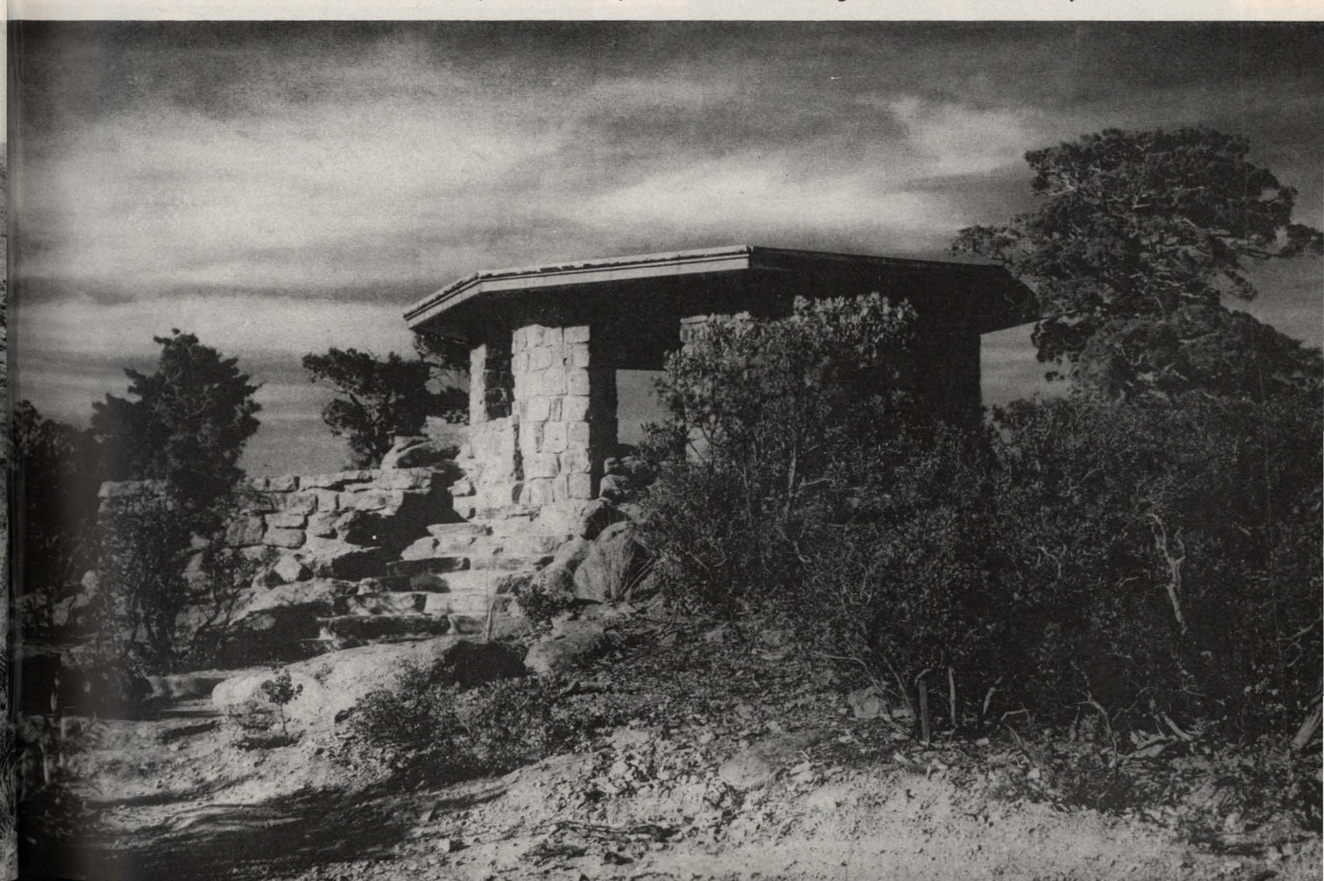
But the visitor who takes time to make use of the numerous trails, really has an opportunity to see the Wonderland of Rocks. Amid hundreds of thousands of pillars and pinnacles, a dozen or more have been found whose striking resemblance to human features, domestic animals, or the works of man have made them nationally famous. The well-planned trails system of the monument leads the visitor, by several loop trips, to all of these features. On the Echo Canyon Trail is "Old Devil-face." Rhyolite Trail passes "Totem Pole" and "The Mushroom." From Sara Deming Trail, it is only a short scramble to the top of a ridge where "The Sheep" surveys his petrified pastureland. But in the Heart-of-Rocks section, Nature has gone into sculpturing with reckless abandon. Entrance to this rare bit of unbelievable imagery is guarded by "Big Balanced Rock" a 16-ton behemoth supported by a base only inches in diameter. And among the concourse of hulking pinnacles lining the head of a tiny canyon are found "Pinnacle Balanced Rock," "Thor's Hammer," "Old Maid," "Duck-on-a-Rock," "Punch-and-Judy," and several others. From a high point reached on the Heart-of-Rocks loop trail, the most scenic vantage point of the monument except, perhaps, the

The rock squirrel or canyon squirrel is one of the common rodents.

Ruins of old Fort Bowie as they stand today marking the spot from which emanated many expeditions of U. S. Forces against the Apaches.

Massai Point, orientation station, tops an eminence from which a commanding view in all directions may be had.





summit of Sugar Loaf Peak, looks down upon the entire rock-rimmed length of spectacular Rhyolite Canyon.

But even the super-interested enthusiast who covers every foot of the trails and explores much of the rugged country in between, fails to see one of the most interesting features of Chiricahua National Monument. For within the bulky volume of American History is a chapter on the Apache Wars, a stirring record of the last stand of the American Indian against the inevitable domination of the white man.

For centuries, the Chiricahua Mountains and surroundings were the ancestral home of the Chiricahua (meaning Great Mountain) group of Apache Indians, a predatory and warlike tribe. Living on wild animals and native plants, these resourceful people moved from place to place according to the requirements of the season and the presence of food. Occasionally they raided the Opata, Sobaipuri, Pima, and Papago; rancheria Indians who farmed the alluvial lands bordering streams in the wide desert valleys. With the coming of the Spaniards who brought European grain and domestic animals, the Apache found increased incentive to pillage.

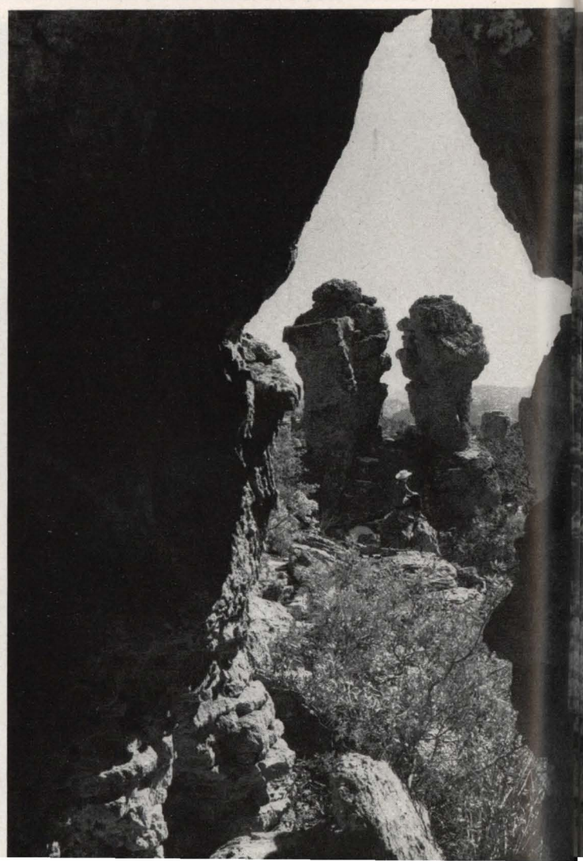
Stolen horses greatly enlarged the power and widened the range of Apache activities, and the southeastern corner of what is now Arizona became a Chiricahua stronghold under the vigorous leadership of the bold and wily Mangus Colorado. With the Gadsden Purchase of 1853, and opening of the area to settlement by United States citizens, Apache raiders became an ever increasing hazard. However, it was not until 1860 that active warfare flared as the results of the unfortunate arrest of Cochise, then chief of the Chiricahua Apaches, at Apache Pass, a station on the Overland Mail Route of the famous Butterfield Stage Line at the north end of the Chiricahua Mountains. A leader of great power and personality, Cochise in his anger became a master tactician and strategist of guerilla warfare, his ferocious raiders ever on the alert to swoop down from retreats deep in the Chiricahua Mountains upon small bands of travelers, prospectors, or others passing through or stopping in the vicinity. Homes of ranchers and settlers were burned, one by one; the ranchers killed, their cattle driven off, and their families either murdered or carried away by the Indians.

Administration center of the monument.

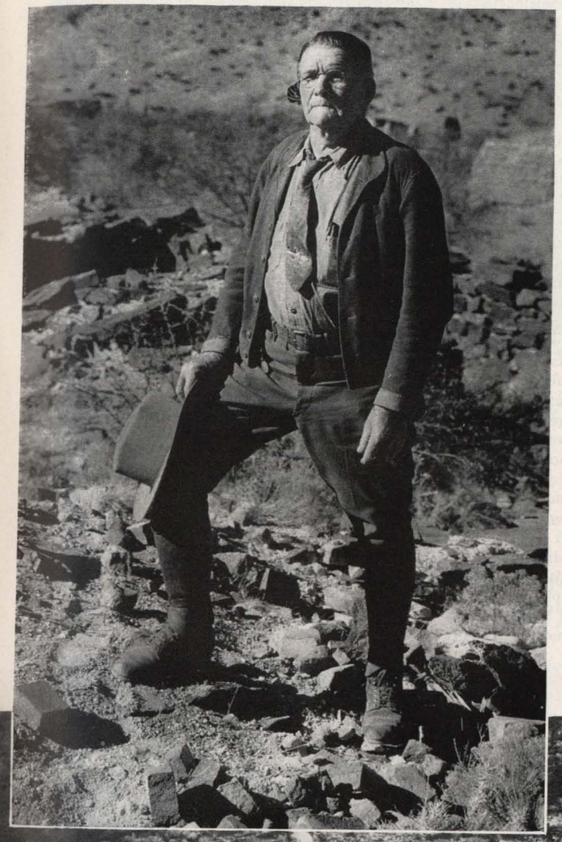
Prehistoric pottery found in Bonita Canyon.

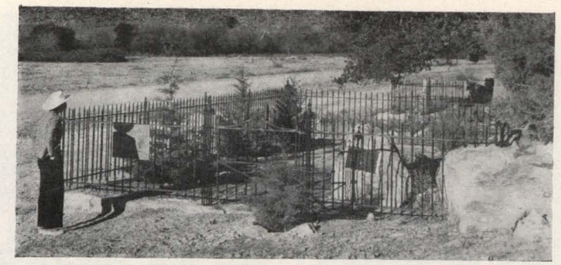
Pinnacles of upper Rhyolite Canyon.

"Punch-and-Judy" is a domestic argument preserved in stone.

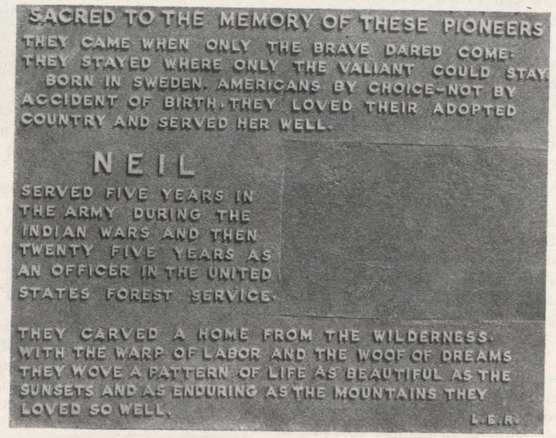


The late Neil Erickson, who served as top sergeant of Troop E, 4th U. S. Cavalry at Fort Bowie.





Pioneer cemetery at mouth of Bonita Canyon, last resting place of Neil Erickson, Indian fighter, rancher, and Forest Service employee.



Faraway Ranch provides the traveler with modern comforts in a pioneer setting.

Although Fort Bowie was established in Apache Pass in 1862, the demands of the Civil War kept the Fort so short handed that an organized campaign against Cochise and his Chiricahua Apaches was not possible. By 1870, white settlement and development of the region had been brought to a standstill, Cochise and his warriors from their strongholds in the Chiricahua and Dragoon Mountains practically controlling the region southward into Sonora, Mexico, and east as far as the Mimbres Mountains in what is now New Mexico. However, in 1872, a truce was effected and for the final two years of his life, Cochise and his loyal followers remained at peace with the white men. Soon after the death of Cochise in 1874, the Chiricahua were removed from their forested mountains and settled with other Apache tribal groups on the San Carlos Reservation.

The home-loving Chiricahua were not happy, dissensions arose, and bands of the more adventurous left the reservation time and again to attack and plunder the whites under such chieftains as Chato, Pionsenay, Victorio, Nana, Loco, and Juh. For ten years, settlers were constantly in fear of an Apache attack. Troops were sent to defend them, and these renegade bands were gradually reduced in numbers, their chieftains tried and convicted of murder, and their followers brought back to the reservation. Most ferocious and determined of these renegade leaders was Geronimo who, from his ancestral stronghold in the Chiricahua Mountatins, led raiding parties in all directions, even into Mexico. Familiar with every trail and retreat, and able to travel rapidly to distant hiding places, Geronimo kept the Southwest in an uproar until 1886 when he was finally captured. He was imprisoned in Fort Bowie from which historic post, on September 8, 1886, he and his ragged band were deported across the continent to Florida. This ended the organized uprisings of the Chiricahua Apaches, the long and persistent fight of a freedom-loving people against insurmountable odds. However, some of the Chiricahua eluded the soldiers, escaped into Mexico, and attacked a settlement of Mormons there as late as 1900.

Somewhere en route to Florida one member of Geronimo's band, Big-foot Massai, is reported to have escaped from the train and, after innumerable hardships, returned to the land of his birth. Although he remained part of the time with members of his tribe on the San Carlos Reservation, he was unwilling to be confined by man-made boundaries and roamed, alone, the haunts of his ancestors occasionally making the long trek into Mexico where, for a time, he lived with the band of Geronimo's followers which had evaded the soldiers.. Last evidence of his presence in the Chiricahuas was in 1890 when his moccasin tracks, recognizable because of their large size, were reported seen in Bonita Canyon. The footprints were followed up Rhyolite Canyon, then up a side canyon, and over a ridge, the canyon and ridge which now bears the name of Massai Canyon and Massai Point.

With fear of Apache raids a thing of the past, prospectors, cattlemen, and ranchers established themselves in the Chiricahua region. Some were soldiers who had served in the Apache wars, liked the country, and decided to remain. Two of these Jhu Stafford and Neil Erickson, took up land in Bonita Canyon, now the entrance to the monument. The original Stafford cabin still stands, and Faraway Ranch, the Erickson homeplace, now operated by Mr. and Mrs. Ed Riggs (nee Lillian Erickson, Neil's daughter), provides meals, lodgings, and saddle horses for monument visitors desiring these accommodations. The big ranch house fireplace is built of boulders, on which are names and dates inscribed by the soldier companions of Neil Erickson during the exciting days of the Apache campaign.

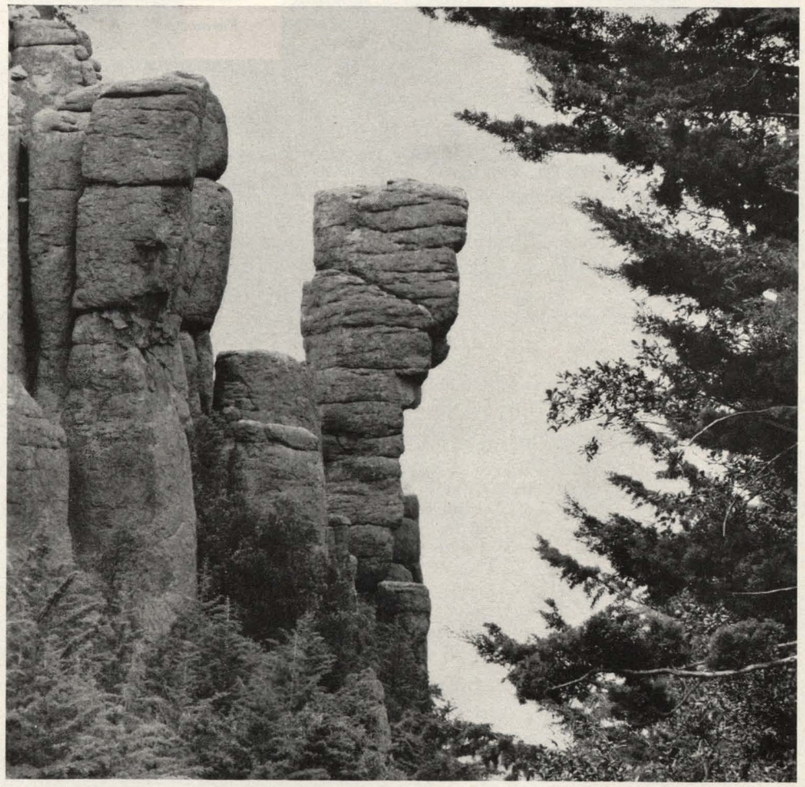
With the opening of the country, development of mines and smelters, and construction of roads, knowledge of the amazing features of the Wonderland of Rocks in the Chiricahua Mountains became widespread, attracting visitors from far and near. That the area was worthy of national attention became recognized, and in April 1924, President Calvin Coolidge proclaimed it Chiricahua National Monument, thus assuring its protection from commercial exploitation and vandalism, and indicating such development as would make its features comfortably accessible.

Today the monument is administered by the National Park Service of the Department of the Interior and is under the immediate supervision of a resident custodian, Frank Fish, with headquarters in an attractive, stone administration building in Bonita Canyon about one mile beyond the monument gate. Here visitors are furnished information about the roads and trails of the monument, and receive explanations regarding the strange rock figures and other natural phenomena which they see or in which they are especially interested. Exhibits interpreting the major features of the monument are being planned and, as time and funds permit, will be built and installed in display cases which have been prepared for them in the administration building lobby.

Construction of residence and utility buildings for the monument was completed by the Civilian Conservation Corps in 1940, the vacated camp buildings being remodeled to provide inexpensive but comfortable tourist accommodations. This development, called Faraway Lodge, is being fitted up, as this is written, especially for the benefit of organized groups for weekend use. The National Park Service will continue to furnish free guide and interpretive service, and if possible, will provide illustrated interpretive campfire talks regarding the various features of the monument on evenings when there are sufficient visitors at the free campground or at Faraway Lodge and Ranch.

With a world at war, the tempo of living, especially in the industrial cities, has increased to fever pitch. War nerves are developed as much, perhaps, by the urgent demands for speed and the irritations of traffic jams, and supply bottlenecks, as by fear of actual attack. But deep in the heart of the Chiricahua Mountains, neither the weird erosional figures, nor the deer, nor the nesting birds know that there is a war.

Summer breezes gently tug at drooping branches and set them swaying. Ed Rigg's well-fed horses surreptitiously snatch tempting bits of herbage from the trailside and feign indignation at slaps urging them to increased motion. Here is a refreshing interlude in a time of trouble, where the harmony of Nature prevails, nerves are quieted, worries dispelled, minds and bodies gradually relax, and physical reserves begin to restore energy, revive hope and optimism. Only the great, grey profile of Cochise Head, in dignified repose on the northern skyline, and the blood-stirring roar of a force of basic trainers riding the beam remind the visitor to Chiricahua National Monument that human beings, still, are unable to live at peace with one another.



"China Boy" is one of the best known rock figures in the monument. It is located near the Bonita Canyon Highway.

Major L. F. Brady explains the direction some ancient lizard was traveling at the time Coconino Sandstone was being formed. This huge piece is a new addition to the Museum.

This could easily be termed the shortest geology trip in the world—40 feet. Dr. Agnes Allen points out ripple marks in red flagstone leading to the science hall on the campus.

"THE WORLD'S LARGEST TEXTBOOK"

ASTC Students at Flagstaff Study Geology Close to Home

BY BOB EVANS

WITH all of its wonders of nature, Northern Arizona with Flagstaff as the center, has become a paradise for authorities and students alike as a place to study Southwestern and general geology. Within a 60 mile radius of Flagstaff a student may see excellent examples of volcanos, glaciers, meteorites, and, with the exception of one, every climatic zone in the world. Several colleges and universities throughout the United States send their students on long and expensive field trips and many leading authorities on all types of earth sciences visit this compact, cross-section of the world in an effort to add to the meager knowledge of the formation of our earth.

All of these natural wonders are in the backyard of Arizona State Teachers College, ready for the students to examine the formations page by page, paragraph by paragraph and line by line. For this reason, students have been coming to the Flagstaff college from nearly all corners of the nation for the purpose of studying geology, or, after arriving at the college, have become interested in the subject from a cultural, hobby or professional standpoint. Many times a student, after seeing the wonderful geology facilities at the college, changes his curriculum to include at least some studies in this field. Consequently, the number of students in these classes is steadily increasing.

It is interesting to note that most students take the course as a cultural science or hobby. This is explained by the fact that most people, until they have the privilege of seeing such sights as Meteor Crater, Grand Canyon, Sunset Crater, Coal Canyon, and all the other geological wonders Northern Arizona is blessed with, do not realize the story behind it all. The coloring is appreciated and the massiveness noted, but, without spending a considerable amount of time, one would not realize that each different layer of rock is a page in a textbook and this textbook is lying open, ready for a person to walk through it, reading as he goes. These natural wonders are the first sparks of interest in the student's mind to learn more of the unexplored earth sciences.

However, natural wonders of Northern Arizona are not the only reason for the ever-increasing interest in this subject at the college. In Flagstaff some of the nation's leading geologists live, one of them being a professor on the subject at the college. This is John C. McGregor, who is considered the leading authority on Southwestern archeology, also a popular subject at the college, and an excellent authority on geology. He is author of a textbook entitled "Southwestern Archeology," the only up-to-date textbook on this subject.

Another leading authority, especially on the Grand Canyon, is Edwin D. McKee, who is regularly employed by the Museum of Northern Arizona and is now on a year's leave of absence as a geology instructor at the University of Arizona. Mr. McKee is author of "Ancient Landscape of the Grand Canyon Region," an outstanding book on this subject.

Dr. Harold S. Colton, founder and director of the Museum of Northern Arizona, has done more than any one other person in bringing to light and encouraging the study of Northern Arizona geology.

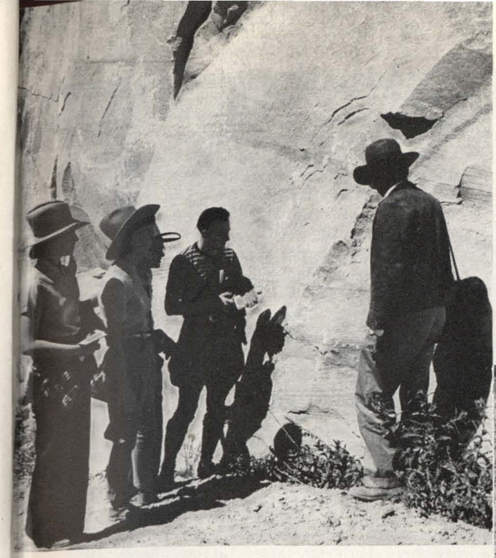
Lowell Observatory, where Pluto was discovered, and where more research work has been done on Mars than at any other place in the world, is within easy walking distance of the college. Dr. V. M. Slipher, considered the nation's leading authority on Mars and all of its mysteries, personally takes the students on a tour of all of the facilities at Lowell Observa-

Warren Ward, student-body president, reads from a textbook to Evelyn Anderson, a music major, who likes geology as a hobby.

A Hopi Indian at the Museum of Northern Arizona shows a student how to follow the grain of rocks.

Students start the eight mile jaunt on Kaibab trail to Phantom Ranch in Grand Canyon. They are passing through Moenkopi formation.

Here students rest while John C. McGregor, points out Kaibab limestone which contains many fossils. At this point students may see many small marine plant impressions.



Prof. McGregor points out cross bedding in Coconino sandstone. The cross bedding is a result of wind erosion.

tory. Included in the tour is a short study of the volcanos on the moon through the telescope. Much of the information learned in connection with these volcanos is a result of the study of earth's volcanos.

Major L. F. Brady, member of the Museum of Northern Arizona staff, is probably the most popular with students because of his unusual ability to tell the story of the formation of our earth in a humorous and highly entertaining fashion.

Dr. Agnes M. Allen, associate professor of science at the college, wrote her doctor's dissertation on Verde Valley geology. A copy of this is kept in Gammage Library and often used as a reference by students. Dr. Allen attends nearly all field trips and teaches several of the geology classes.

Aside from the above mentioned, students have the opportunity of hearing talks from authorities of Grand Canyon National Park, such as Dr. Harold C. Bryant, superintendent of the park, and Louis Shellback, chief naturalist and geologist.

All of the above mentioned contribute heavily to the success and popularity of geology courses for students at the college.

At present, facilities at the college do not permit a major in earth sciences, but following the war it is expected to add enough courses in this line to permit a major. Student demand has been the big factor causing the administration to increase geological facilities. Dr. T. J. Tormey, president of Arizona State Teachers College, has always attempted to add courses to the college, other than required classes, which the students express a desire for, and it is because of this popular demand that Dr. Tormey has promised greatly increased attention to the earth sciences.

The first geology class offered students, and probably the most popular, is general geology, a pre-requisite to the balance of the earth sciences. In this class the student first studies the theory from various textbooks, and then goes into the field and actually sees all of the "dry" and bewildering theories graphically illustrated by Mother Nature—the difference between Arizona State Teachers College and most other schools. In the course's textbook, a survey was made to see examples of all theories presented in the book. It was found 60 miles would be sufficient radius. The only theory of which an excellent example cannot be found would be evidence of glaciation, although there are some evidences on the beautiful San Francisco Peaks, which are studied each year.

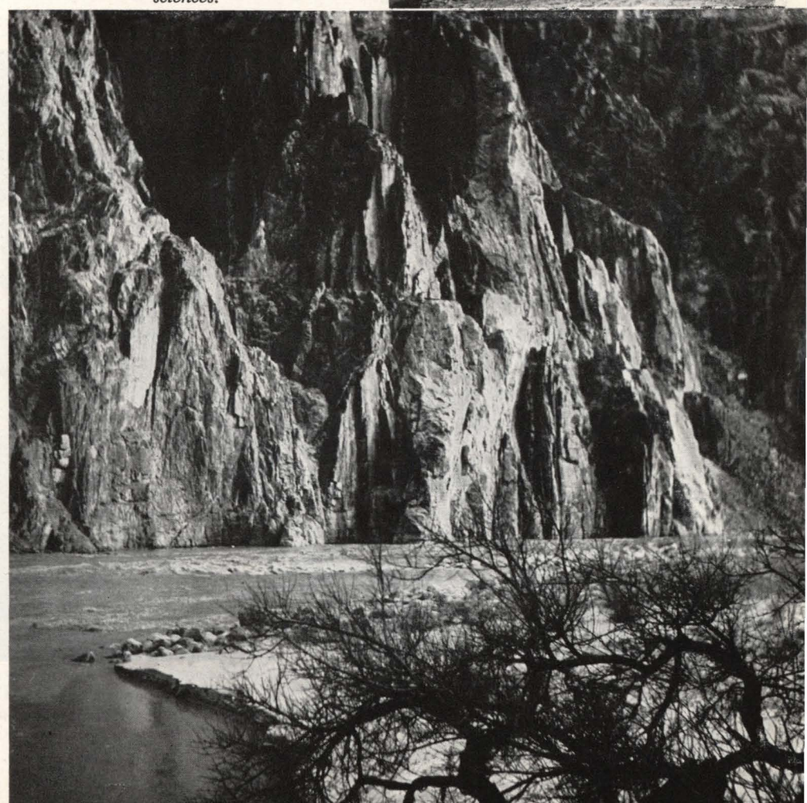
From the textbook an attempt is made to paint a picture for the student of what Northern Arizona looked like millions of years ago, but the picture is transformed into a vivid actuality when interesting field trips are taken Here they see the picture fossilized into solid rock. During the Triassic period, the age of dinosaurs, the country around colorful Coal Canyon, in the heart of the Navajo Land, was submerged by the ocean and students, while on a field trip, are thrilled when they find well preserved shells of brachiopods, coral, sponges and crinoids. Alternating beds of sandy, shale and lime material show the variation in depth of this prehistoric sea. Sights such as these give students the urge to dig in deeper for knowledge of our earth's formation.

During the fall, few trips are taken by students in this elementary geology course, because they would be unable to understand and appreciate the things pointed out to them until after they are instructed in the general theories. However, one trip, to the Museum of Northern

As the students go further into their textbooks, hot weather causes all jackets and sweaters to come off and less attention points toward geology in an effort to get to the food and showers at Phantom Ranch.

Pictured is a view of the oldest rocks in the world, found in the inner gorge of Grand Canyon which the mighty Colorado River is continually cutting deeper and thereby answering more questions concerning the earth sciences.

Pictured are some of the students on their Grand Canyon field trip just before they enter the tunnel leading to the suspension bridge where they will cross the Colorado River and journey on to beautiful Phantom Ranch. In the front and center of the group is Dr. C. E. Hablutzel, professor of science at the college who often makes the trip just for enjoyment.

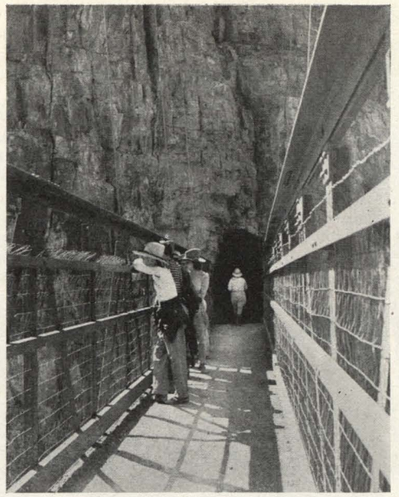


Arizona, is always looked forward to by the students. Here, for the first time they see exhibits of all kinds of rocks, fossils and faults, along with elaborate laboratories and experimental machinery. On the Museum field trip students are shown how fossils are extracted, rocks are cross-sectioned, polished and ground, tree rings are read and, all in all, it is when they first begin to enjoy and appreciate geology. Dr. Colton or Major Brady always conducts the class on this tour, both men being highly popular with the students.

Perhaps the shortest geology field trip in the world is also taken in the fall of the year by students, when they leave the class room to study red sandstone rocks that form the steps leading up to the science auditorium on the campus. This trip is about forty feet. These steps have excellent examples of ripples which were formed by the wind and later hardened and preserved. All of the campus buildings are constructed of red Coconino sandstone, also pointed out as examples by instructors.

The Grand Canyon of the Colorado is undoubtedly the greatest textbook of geology on the face of the globe and, when spring begins to arrive, the neophytes get anxious to see this geologists' paradise. In the textbook they have read how the canyon was formed, the various kinds of limestone, sandstone shist, shale, magma, and nearly all other types of rocks, and they realize what a wonderful opportunity the canyon presents to actually examine these things first hand. They have memorized every geological era from Cenozoic to Archeozoic. They study every climatic zone and the various effects of erosion and weathering of each zone. From the bottom of the canyon to the top of San Francisco Peaks all of these zones are represented, with the exception of the Tropical zone.

The students, along with their instructor and one of the National Park geologists, enter



The next morning, although feet are still blistered, the students have a new outlook on life. They get to ride the mules up. While waiting for the mules, they stand on the suspension bridge watching the mighty waters of the Colorado roar beneath. At times, over one million tons of silt is carried by the water past any one point every twenty-four hours. The small grains of silt form one of the biggest eroding agents which dug Grand Canyon.

their Grand Canyon textbook on Kaibab Trail and return on Bright Angel Trail. However, they find that the front cover and the first few pages have been torn out and destroyed, for erosion has stripped over a mile of sedimentary rock formations that once existed above the present rim of Grand Canyon. There are only two fragments of these pages left in the immediate vicinity of the park, represented by the Red Butte and Cedar Mountain examples of the Triassic period of the Mesozoic era, the era when reptiles reached their peak. As the students start down the trail, the first formation, or page, is Kaibab Limestone. This was formed from marine life and sandy material on the floor of a warm Permian sea that encroached from the west. Traveling on down the trail the students come to Coconino sandstone, the second complete page of their book. Because of the obvious cross-bedding, a conclusion is nearly always reached by the students that this was formed by wind blown sand dunes somewhere near the sea. Also in this they find tracks of animal life going up hill, probably because the animals left the water in the morning when the sand was still wet.

And so, the students journey on through the pages of their textbook, studying various fossils, tracks, gathering rocks for collections and making notes of all the wonderful information supplied to them by both nature and instructors. However, after hiking almost all day, they begin to lose interest because of hunger, blistered feet and hot weather until they come upon the inner gorge and find themselves surrounded by the oldest known rocks, those of the Archeozoic era. From the bottom of the gorge they look up at sheer walls of ancient metamorphosed rock, higher than man's tallest structure, the Empire State Building. The Archean rock is composed of Vishnu schist intruded with granite and pegmatite and it is easily seen how these dark rocks were twisted and squeezed under tremendous heat and pressure.

The first thing students do after reaching Phantom Ranch, located just above where the clear waters of Bright Angel creek flow into the muddy Colorado, is to remove shoes from hot, blistered feet and later go for a swim in the pool, after which they eat what is usually termed "the biggest meal of their lives." Following the meal, students, instructors and cowboys at the ranch gather on the edge of the Colorado to watch the moon rise over the inner gorge to form gigantic and weird shadows. Usually the students are well entertained by tales of the cowboys.

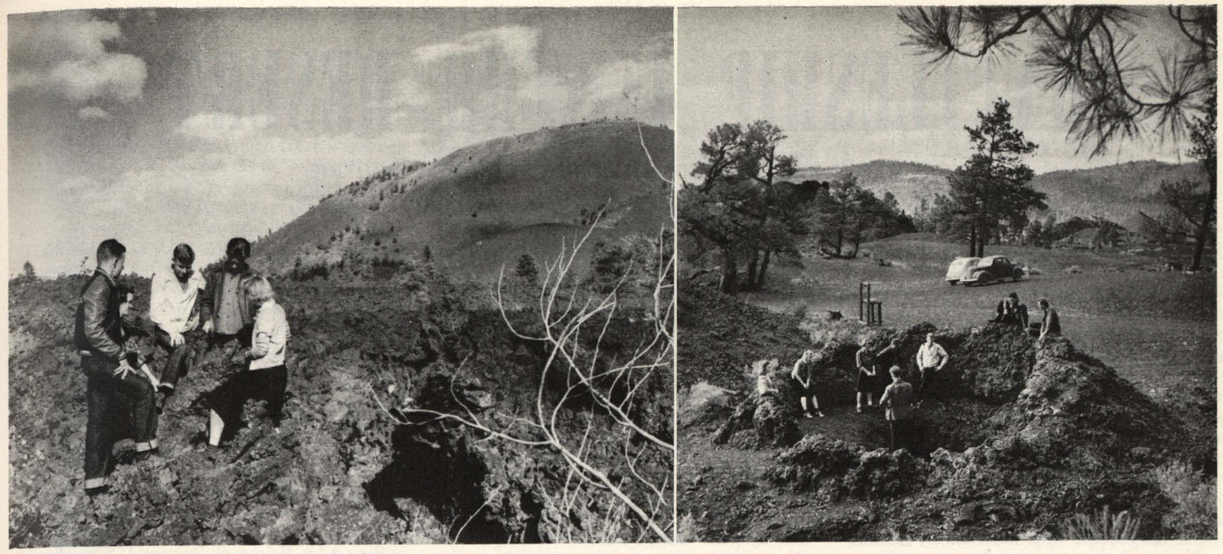
In order that students may obtain a panoramic view of this world wonder, the extensive study of geology is dropped when the students begin the trek by mule back out on Bright Angel Trail, although they continually watch for fossils.

Generally this trip gives all students a better understanding of how minor and small the human race is compared with the millions of years of continual tearing down and building up of our earth's surface that took place long before the appearance of the first human. One student, who lived in Yuma all of his life, never having gazed upon the beauties of mountains, had received considerable publicity as a football player. When he stepped off his mule, his first remark was, "You know, I'm not nearly as important as I used to think I was."

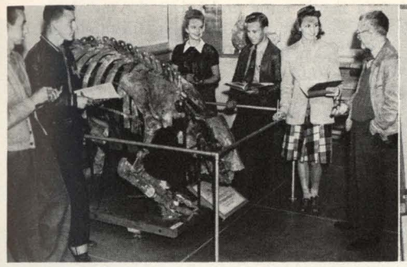
The next big thrill for students comes when they are taken to Coal Canyon in the heart of Navajo Land, on the reservation north and east of Flagstaff. This trip is made in one day and usually a member of the Museum of Northern Arizona accompanies the students.

On the way to Coal Canyon, stops are made at the Petrified Pumpkin patch, Dinosaur tracks and Moencopi Indian village.

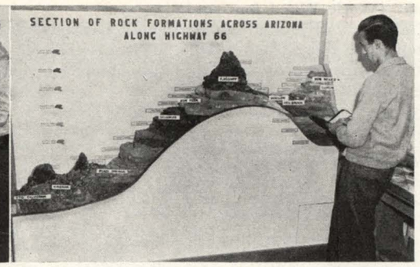
The class, nearing the end of their two-day journey through the "world's largest textbook." The students walk into the Grand Canyon and ride the mules out.



The volcanic area about Flagstaff always proves extremely interesting to the student. This is another page in the story of the world making that can be read in the "world's largest textbook."



Students always enjoy and appreciate the the explanation of Major L. F. Brady about this pre-historic fossil. It is commonly referred to by students as "Major Brady's grasshopper."



A student studies a cross-section of Highway 66 from Lupton to Needles. Traveling from Lupton to Flagstaff, it is possible to observe rocks from every geological era in sequence, in more detail from Flagstaff to Needles.

The legend of how the pumpkins petrified is completely discarded by students after they learn of the geological theory. Dinosaur tracks always hold a great deal of interest for the students and, while examining huge tracks, one of the students, or Major Brady, nearly always suggests that some member of the class follow the tracks and eventually they will find a dinosaur's fossil. Often the visit to Moencopi village is the first time class members have the opportunity of seeing a real Indian village which has not been built by white man for the benefit of tourist. Of course, there is little value of this stop from a geological standpoint, but the instructors attempt to give the students a chance to see everything possible throughout the field trips.

Returning from Coal Canyon, all pockets bulge with the many fossils found in that area. After the first few field trips, the now amateur geologists have started a collection of rocks and fossils, sometimes developing into an exceptionally fine assortment. It has been traditional with class members to donate some of the finer specimens to the school's museum, As a result of this, many fine rocks and fossils are always available for new students to examine.

Many other fine field trips are taken each spring, but the place and time often depends on staff members of the Museum of Arizona. Many times they will have some work to do in the field and invite the class to go along. Other times the staff members go along just for the enjoyment. The Museum often helps students through school by hiring them to classify fossils and doing other work. School officials have always been highly gratified by the fine cooperation of the Museum staff.

Several unusual students have attended the college and become interested in geology or physical science. Among them is Wayne Bryant, son of Dr. Bryant of the Grand Canyon. Mr. Bryant originally came to Flagstaff for a major in Biology, but after his freshman year, the major was switched to physical sciences. He plans to attend the University of Colorado his last year so that he will be able to obtain a degree in this line. A brother of Mr. Bryant, Herwil Bryant, was on the Byrd expedition to the Antarctic.

Another boy came to Flagstaff from Chicago to study geology and after taking all of the courses offered, he found his interests were pointed toward erosion. He is now employed by the government as an erosion expert among the Pinto bean farmers near Flagstaff. A girl attended San Diego State as a geology major for two years and then came to Flagstaff to continue her studies in the field. And there are numerous examples of other students coming to Flagstaff for this field, not because the class is pushed and highly advertised, but because they read of this part of the state in textbooks.

Not only have the natural wonders near Arizona State Teachers College aroused interest in earth sciences, but also the Hiking club, one of the most active organizations on the campus, takes many trips each year. Nearly always, the geology students are leaders in this club. One major hike is taken by this organization each spring. The hike is to Rainbow Natural Bridge, Phantom Ranch or Havasu Canyon, depending on the year.

Yes, Arizona State Teachers College at Flagstaff, like Arizona, is blessed with beauties of nature which cannot be taken away from her. After the war, many of her students will return to their campus and continue the studies of Mother Nature, thanking her for placing them at their disposal.

Edwin D. McKee points out an excellent example of contact metamorphism, resulting from an igneous intrusion near the rim of Oak Creek Canyon.

BATTLESHIP IN THE DESERT

THE U. S. S. "BEARDOWN" ISN'T LISTED IN JANE'S FIGHTING SHIPS BUT SHE IS DOING A VALIANT JOB FOR OLD GLORY

PREPARED FOR ARIZONA HIGHWAYS BY THE U. S. NAVY PUBLIC RELATIONS OFFICE, ELEVENTH NAVAL DISTRICT

OFFICIAL U. S. NAVY PHOTOGRAPHS

"AYE, AYE, Sir!" when properly spoken means "I understand your order, I can execute your order, I will execute it, and I recognize the authority vested in you to give the order."

That is the connotation of those three brief words. Together they comprise the most-used phrase in the naval service, and the least understood by those outside the service.

It is one reason why the recently-commissioned-from-civilian-life Naval Reserve officers spend their first 60 days in the Navy at a Naval indoctrination school, similar to the one situated on the University of Arizona campus in Tucson.

The naval establishment in that southern Arizona city, while entirely landlocked, is a veritable "ship in the desert." She has a bow and a stern, and she has, most importantly, a name—the U.S.S. Beardown. Her name is not however, listed in "Jane's Fighting Ships." Nor will you find in the daily press any mention of her christening as such.

But for all that, her commanding officer, Capt. Willard E. Cheadle, U.S.N. (Ret.), has trod many a ship's bridge in his 31 years of Navy life, which began when he emerged from the U. S. Naval Academy at Annapolis, Md. as an Ensign of the line in 1912. He, like any true naval officer, knows well what an "aye, aye, sir" should mean.

Early October last the "desert ship" received her first complement of officers and men—nearly 100, which is somewhat less than the peace-time complement of a "four-stacker tincan" (World War I four-stack destroyer).

They came aboard her with high hopes, a cargo of textbooks and all the other materials, which, when fused in the proper proportion can produce a naval training school.

The thing they could not bring with them—naval tradition—must come slowly out of the conglomerate of their teachings and their disciplining of the student-officers who arrive fresh from civilian pursuits.

Captain Cheadle and his capable staff of officers are attempting to instill in these student-officers more than the meaning of "aye, aye, sir." They are giving the trainees basic information which will enable them "to know what to do when no one is around to tell you," as Rear Adm. Ralston S. Holmes, U.S.N. (Ret.), former 11th Naval District Commandant, told First Battalion graduates December 11, 1942.

But it is by no means an easy task to reach into a man's mind and inject the naval viewpoint, which is a composite of tradition, expediency and generic knowledge. The men who come to the desert ship have been reared in different locales, have been subjected to contrasting environments, have trained themselves for numerous divergent civil professions. They may have one creed—but they are of a hundred minds.

What then do these aspiring student-officers absorb while at this desert naval school—far removed from the native habitat of most seafaring men?

That was the question which flashed through the minds of many Arizonans when the site for the school had been selected. They knew that the nearest real water was a few hundred feet below the crust of the Tucson desert—a subterranean river—but hardly navigable. How could you make a naval officer of a quondam civilian in such a location? Tucsonans especially were puzzled.

But the Navy had not chosen the University of Arizona for lack of any other place to train reserve officers; there were countless other sites available. The very fact that Tucson *was* isolated from any other naval life was sufficient to bring about affirmation.

Officials reasoned this way: "These men are entering a new life, perhaps a confusing one to them, in the beginning. The transition must be gradual, not abrupt. Teach them the basic things they need to know, then let them board ships. They will be prepared for it by that time. A man's viewpoint can change radically in 60 days time. Let the naval way of life sink in. We are trying to make the transitional period easier for each man, thus he and the Navy both profit."

Drillmasters and a platoon of naval student officers practice the manual of arms. It's "port arms" here.

Four battalions have graduated from the desert ship since she set sail October 15, 1942. Four groups, each numbering 500, have come and studied and drilled under the omnipresent Arizona sun, and have gone to quench another, less popular but more incarnadined, sun.

These 2000 are the proof of the pudding. . .

Basically the training program is three-dimensional. One phase stresses theoretical knowledge of seamanship, ordnance, navigation, naval administration, and naval regulations, and customs. A second phase emphasizes physical conditioning, which includes recreational play, calisthenics, corrective physical procedure, and determination of strength quotients. The third accents military drilling, the manual of arms, military conduct and bearing, achieving its object by rote methods.

Because most student-officers who come to Tucson are college graduates they seldom encounter difficulty with any of the scholastic requirements of the course. And, as perfection in military drilling and the manual of arms is a matter of practice more than anything else, in this too, few experience failure.

But, except for men athletically inclined, the physical portion of officers' training is exacting and difficult. Each man, according to Chief

Student officers of the U. S. Naval Training School applauded Rear Adm. Ernest L. Gunther, U. S. N., 11th Naval District air officer, and San Diego Naval Air Center Commandant, when he spoke briefly to them at the Fourth Battalion graduation exercises. "Above all else," the Admiral said, "carry on."

"Hutt, two, three, four . . ." bellows the student-officer platoon leader as these student officers of the U. S. Naval Training School at Tucson head for classes across the University of Arizona campus. To a student-officer, the word "hutt' is the naval equivalent of "one" and is accented by the platoon leader to lend cadence.

An entire battalion of student-officers strides along for the first class of the day at the U. S. Naval Training School. Note that only the student-officer platoon leaders carry books in left hand—they're the only ones required to render the hand salute while marching. Men in ranks salute on the order "eyes right."

Specialist W. K. Kliewer, U.S.N.R., is expected to score 200 points in strength tests, which include chinning the bar, push-ups, body levers, and the standing broad jump. To satisfy Navy standards, a student-officer would have to chin himself 10 times, pushup 15 times, execute 25 body levers, and leap 6 ft. 6 in.

Those who score less than 200 points, and 14 per cent fail the initial test, are placed in a corrective platoon and every effort made to raise their strength quotient. Records indicate that these men increase their score by 34 per cent at the conclusion of their 60-day course. Furthermore the over-all average for all men tested at the naval training school for the first five months showed an average increase of 40 points for their 60 day period. Few fall below Navy requirements in the final tests. The highest number of points ever scored by any student-officer is 430.

Student-officers must master the program mapped out for them by Navy training technicians, because their commissions are probationary while they are undergoing indoctrination. A deficiency in any one of these phases may be sufficient to return one to civil life. As a result, all work assiduously at the task of becoming officers.

While the course outlined for these student-officers is ostensibly of three dimensions, the officer himself constitutes the fourth. Whether or not he has the inherent qualities required of a naval officer is highly important. Without proper response from the student-officer the Navy can do little.

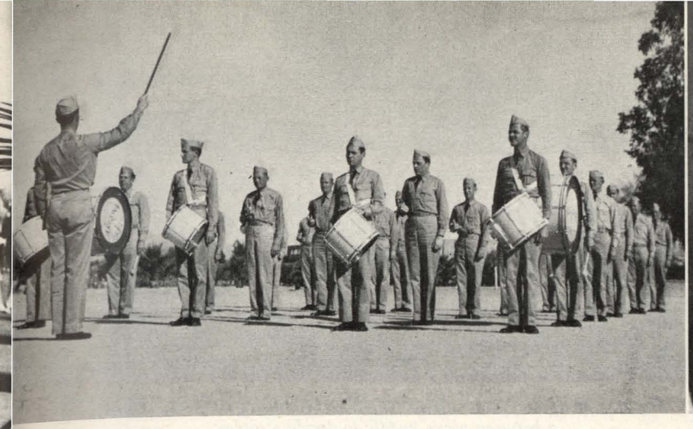
"Men make themselves officers. We give them bare essentials, but they alone must transform themselves," explained Captain Cheadle. "Many of them wonder when they get here, exactly what an officer is expected to be. That's where we come in."

That hallowed English admiral, Lord Nelson, around whom revolves so much naval tradition and custom, summed up succintly the requisites of an officer. "As you from this day start the world as a man," he said, "I trust that your future conduct in life will prove you both an officer and a gentleman. Recollect that you must be a seaman to be an officer; and also that you can't be a good officer without being a gentleman."

In addition to age and educational requirements, the Navy demands that officer-candidates should have, in some measure, the following attributes: ability to lead, willingness to shoulder responsibilty, loyalty, a spirit of cooperation, fearlessness, confidence, honesty, tactfulness, patience, fairness, coolness of mind, and consideration for others. Beyond these basic qualifications a man must acquire a mastery of his particular billet when he has finished indoctrination.

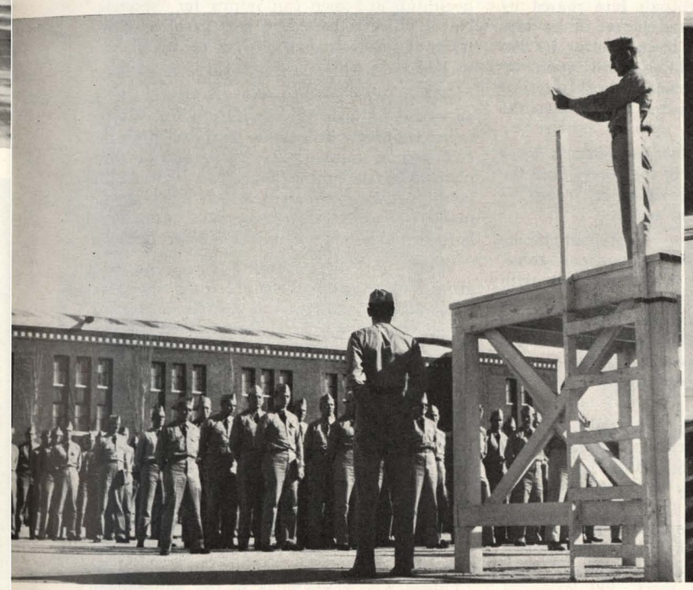
After a few days at the Tucson ship on the desert these student-officers begin to learn Navy terminology. Things are no longer "left"or "right"; they are "port"or "starboard." A floor is the "deck," and anything above is "topside." They begin to acquire the habit of saying "sir" when addressed by a senior

Upon the shoulders of these four naval officers falls the administration of the "battleship in the desert." Capt. W. E. Cheadle, U. S. N. (Ret.) (right) is commanding officer.

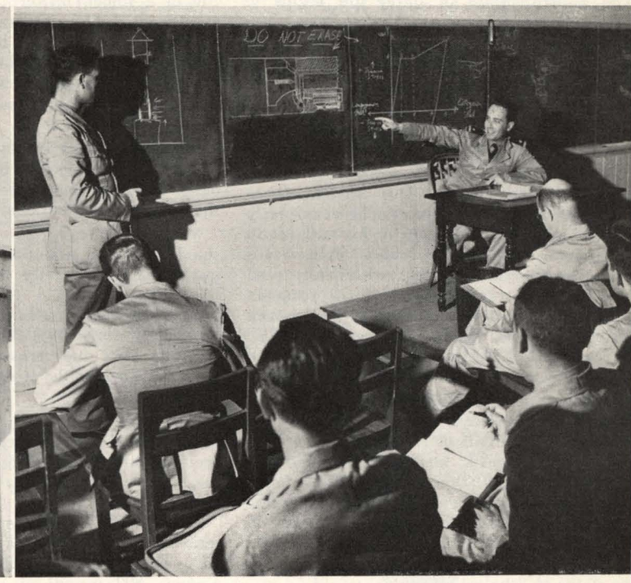


Here's the student-officer band, all set to strike out with a snappy marching tune for marching feet.

Three student-officers at the naval training school eye that delicious Navy "chow."



Student-officer regiment stands attentively while the orders of the day are read to them.



Ordnance instructor (seated) outlines to student-officers what occurs in breech mechanism of a gun.

Here a Navy chief gunner's mate holds high a string of 50 calibre machine gun bullets.

Student-officers lose 6 ccs. of their blood—for typing purposes by Navy medical officers.

Softball is popular as a recreation among student-officers. Many haven't played since they left high school.

Touch football, too, finds numerous adherents among trainees. Here's a between-plays huddle to decide strategy.

officer. Hands that were more often than not shoved into their pockets, now stay outside. The punctiliousness of naval life begins to dawn upon them.

Many of the aspects of the military system, which were incomprehensible to them as civilians, now are clear in their minds, and now become meaningful and expedient. They are suddenly imbued with a yen to know all one can in the space of two months.

In their zealousness to learn they occasionally commit errors. One student-officer will probably never forget that he erroneously saluted a Tucson policeman in his enthusiasm to conform with military rules. Fellow officers, who saw the faux pas, immediately (and good-naturedly) nominated him the recipient of an ignominious title, conferred weekly upon the student-officer pulling the biggest "brodie" of the week. The name of the humiliated officer is charitably omitted.

During their training, while aboard the "ship," student-officers are purposely deranked. All insignia of rank is removed from their khaki uniforms, and khaki overseas caps supplant the regulation visored officer headdress. Only when they "go ashore" for weekend liberty to stroll the streets of Tucson do these officers resume their rank, and don their gold-striped blues. In training they have only the status of "student-officers."

Their days at the naval training school are crammed with activity. A typical day in the life of a student-officer finds him roused by reveille at 5:30 a. m. and tucked-in by taps at 10 p. m. In the 16-hour interim he has few spare moments. He is hard at it by 5:45 a. m. warming up with a brisk physical drill, which makes breakfast at 6 a. m. none the less tasty or welcome.

Of all the day's routine, no event is more impressive, or symbolical of the Navy, than the daily 8 o'clock morning ritual of "colors"—the raising of the national ensign.

While two companies of student-officers stand stiffly at attention, a four-man color-guard marches smartly to the flag-pole with the colors. As "Old Glory" starts upward toward the peak, hands flash rhythmically in salute, and three buglers blare forth the fact that the stars and stripes are ascending. In the grey dawn of the winter the ceremony has added inspiration.

Five minutes after colors, student-officers launch into the morning classes, of which there are three, the third ending at 11:55 in time for the midday meal in the recently-constructed messhall.

Incidentally, these men take their eating seriously. In a single day they will consume 1500 bottles of milk, 500 grapefruit, 1000 oranges, 800 pounds of meat, 300 loaves of bread, 150 gallons of coffee, 240 heads of lettuce, and 150 pounds of butter. The diet is healthful, and men can return for "seconds." Naval officers there said that great care was taken to allow student-officers plenty of time in which to eat.

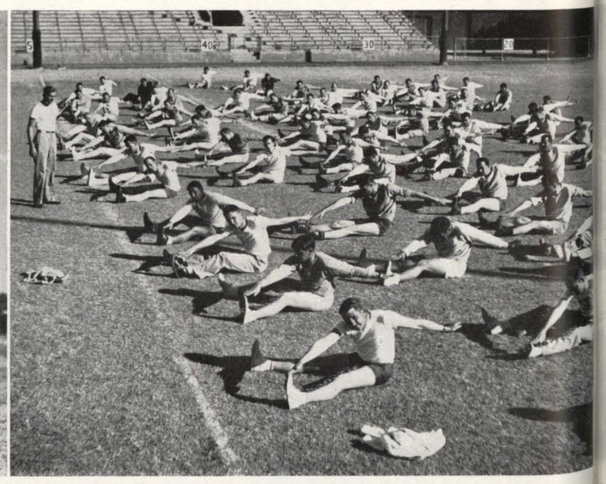
Lunch over, student-officers march off to an early-afternoon class, which is followed by either military drilling or physical training. It is not an unusual sight to see two or three platoons of students in formation learning the more than 20 commands which comprise the manual of arms. Touch football, softball and horseshoes are popular recreation for the men.

When physical or military training ends about 5 p. m. student-officers troop into quarters, shower quickly and march to dinner, which continues from 5:30 to 6:30.In the evening they will either see an instructive motion picture, or hear a lecture delivered by some military person lately arrived from combat duty.

One of the most interesting speakers which the desert shipmates heard was Col. LeRoy P. Hunt, U.S.M.C., the commanding officer of the first assault troops to land on Guadalcanal August last. Colonel Hunt told them of his experiences there, and briefly outlined techniques of jungle-fighting against the tricky Japs.

Others who contributed to the enlightment

Some 25 body levers, which student-officers are executing here, are required to pass the strength test.



Stretch, men!" barks the calisthenics instructor. Exercises such as this are a required part of the training.

of the student-officer were Hon. Hiram Bingham, former U. S. senator from Connecticut; Lt. Col. J. J. Gannon, U.S.M.C.R.; Lt. Comdr. H. S. Munson, U.S.N.; Lt. Comdr. I. S. Hartman, U.S.N.; Lt. H. W. Nicholson, U.S.N.R.; First Lt. Ruth M. Straub, Army Nurses Corps; Lt. (jg) A. Wright, U.S.N.R., and C. H. Older, T. C. Heywood and Ed F. Overend, all members of the American Volunteer Group of "Flying Tigers," who operated with such efficiency in China under command of Brigadier Gen. Claire Chennault, A.A.F.

The student-officer turns in at 10 p. m. when taps sounds. Tomorrow is another day, but slightly different from today.

However, life aboard the good ship U.S.S. Beardown is seldom humdrum. There is the usual amount of good-natured ribbing. The loudspeaker system periodically belches forth orders of the day and other miscellaneous data

Sextants in hand, these navigation students are learning to shoot the sun.

of concern to these embryo officers. Rivalry, of a friendly nature, exists between battalions. Esprit de corps among these men is high, and they are determined to carry out the imperative of their ship's name—"bear down."

Although the phrase orginally had no application to the Navy or the war, it always had a fighting connotation. Behind it there is a story of courage, and of devotion to a common cause.

Back in the middle twenties the most talked of and respected figure on the University of Arizona campus was a likeable young man whose name was "Buttons" Salmon. Buttons was student body president, and a star backfield man on the Wildcat football eleven, of which he was also captain.

One Sunday afternoon, midway in his last football season, Buttons was seriously injured when his roadster overturned on the highway (U. S. No. 89) which runs from Florence to Tucson.

As he lay near death in a hospital bed, Buttons could think only of his team. What might be their reaction when he was gone from the lineup? They *must* carry on as though nothing had happened—that was the one thing which Buttons knew as the end grew near. And in that last infinitesimal moment of life, Buttons Salmon admonished his teammates to "bear down." Then Buttons died, the words still on his lips.

Buttons Salmon was gone, but the magnanimous admonition from a brave fighting man to his buddies never will be forgotten so long as the University of Arizona has athletic teams. Since that tragic day those two words have been the battle-cry of Wildcat teams, who remember them most vividly when the going is tough.

The student-officers who have borrowed this brief fighting slogan for the name of their desert ship can remember them also. And when the going is tough and the battle waxing hot, they too can "bear down." After 60 days of indoctrination, they know what "bearing down" really means!

The Bandar Log Press

(Continued from Page Nine)

of them, for instance, remembers him in flashing visions, always breezing past with overcoat flying, acting on sudden impulses; another remembers him as a good fellow, holding open house for his newspaper friends among his wonderful collection of books and drawings; another recalls his quaint sayings, rare humor, and cheerful smile; another sees him in memory as a surpassing craftsman as well as the fastest pen-and-ink artist in the world.

Of course Frank Holme worked under special difficulties. Of his life in Arizona he wrote in a letter: "Our daily routine is not calculated

Holme sketches of those in the news around the turn of the century.

to develop that strenuosity of which Teddy speaks. We get up reluctantly about 8 a. m., breakfast, then loaf around the tents—maybe take a short walk on the desert, more often stretch out on canvas cots and go to sleep in the sun; lunch at twelve and then we sure go to sleep for an hour or so, then sit up and swap lies or shoot craps or ask each other questions to be answered and proved by the 'World Almanac.' After supper we visit each other's tents and swap lies, or sit by the stove to read or write letters till bed time ought to be about 9 o'clock. And yet I suppose that somewhere in this favored land people are hustling and working and rushing around just like I used to see them in Chicago."

Chicago—his friends there had not forgotten Frank Holme. Chicago artists held an exhibition of paintings and drawings which Holme

could not attend. So they made copies in miniature, framed them, and sent them to Phoenix on a special train with William Randolph Hearst and his congressional party. They were presented to Holme in the old opera house at Phoenix. "What could I say?" Holme wrote to his wife. "Carnegie with all his money could not have had such an exhibit as they sent me."

Holme's desire for companionship led him often to the office of the Arizona Republican in Phoenix where he made friends of all the newspapermen including the late "Uncle Billy" Spear; and his desire to be doing as much as possible led to overwork. In the summer of

1904 Holme went to Denver to "take a shot." There he died in July.

Today in Phoenix the chicken house press-room and the tents have gone; the ranch itself has been subdivided to make space for a thriving city—hardly an echo there now of that road-song of the Bandar Log:

"Here we sit in a branchy row
Thinking of beautiful things we know;
Dreaming of deeds that we mean to do,
All complete in a minute or two—
Something noble and grand and good,
Won by merely wishing we could."

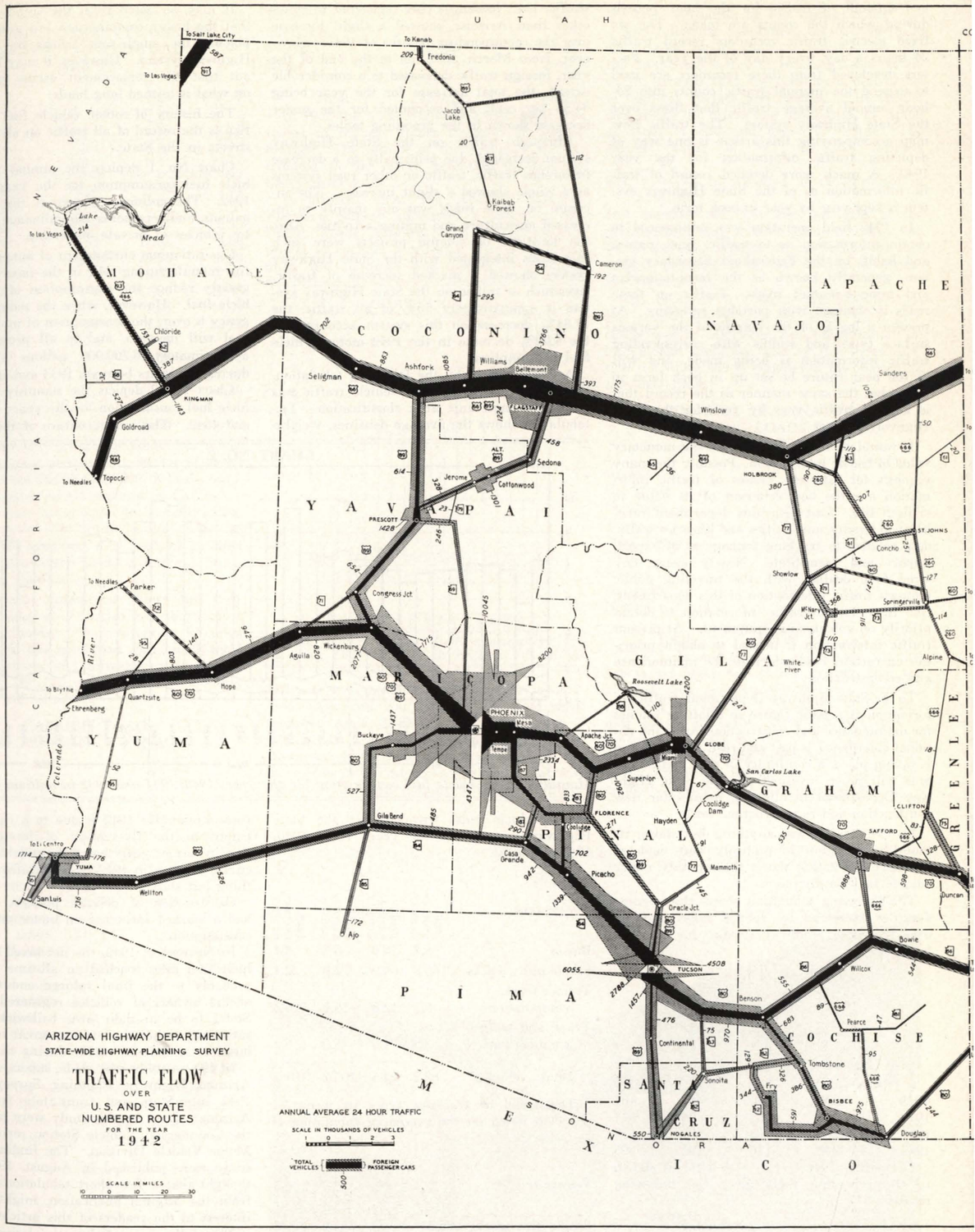
Highway Traffic--1942

By IRA L. WOOD
TRAFFIC STATISTICIAN
Arizona Highway Planning Survey
Arizona Highway Department

FROM various sources, the Arizona Highway Planning Survey obtains data to keep in touch with the volume and type of traffic flowing over the State Highway and Secondary or feeder road Federal aid systems.

Traffic information for the State Highway system is obtained from two different sources: manual counts at strategically-located intersections, and from six fixed electric traffic recorders. Manual counts are taken once a month at important intersections controlling traffic breaks; at less important intersections four times a year; and at some intersections only twice a year. Information from manual counts is used to determine the type, nature

THE PHOTOGRAPHER—CHUCK ABBOTT
THE SCENE—SALT RIVER U. S. 60 BRIDGE



This map tells the story of traffic over the U. S. and State numbered routes for the year, 1942. Despite travel curtailment caused by th war, traffic fell only 17.84 per cent as compared to the previous year. Some roads integrated with the State system showed marked increas in traffic because of defense activity, so much so, that overall 1942 motor vehicle consumption fell only 5.09 percent. Foreign traffic ov the state system showed a drop of 34.33 per cent for 1942 as compared to 1941

and amount of traffic for the hour periods during which the counts are taken. The six fixed electric traffic recorders record traffic 24 hours a day, every day of the year. Factors developed from these recorders are used to expand the manual traffic counts into 24-hour annual average traffic that flows over the State Highway system. The traffic flow map accompanying this article is one way of depicting traffic information for the year 1942. A much more detailed record of traffic information as of the State Highway system is kept year by year in book form.

In 1942 field operation was commenced to obtain information as to traffic, type, nature and habits on the Federal-aid Secondary system, generally known as the farm-to-market and mine-to-market roads. Traffic on these roads is obtained with portable recorders. At present a log as of the lengths of the various surface types and widths with corresponding traffic information is being made, and will in the near future be set up in book form in somewhat the same manner as the record that is kept of traffic year by year for the State Highway System.

It would be hard to determine the monetary value of traffic information. Possibly the many requests for different phases of traffic information are the best criterion of its value to civilian life. Last year this department furnished to twenty universities and libraries traffic data relative to trucking tonnage as of export, import and trans-State. Nearly every day some firm dealing with the traveling public requests traffic information of this department. One firm wished traffic information to obtain priority on vulcanizing equipment. At present traffic information is needed to obtain priorities on certain road materials for maintenance and reconstruction.

To the State Highway Department, traffic information is a basic figure in allotting monies for maintenance and construction. After the national emergency is past and road rehabilitation is taking place, a continuity of past traffic records will prove invaluable to the State Highway Department in allotting monies for new construction and reconstruction work.

In 1942 traffic was anything but static; its monthly variation is probably best depicted by chart No. 2 that shows the monthly motor vehicle fuel consumption.

The following tabulation shows the average densities, weighted by vehicle miles traveled over the State Highway system, for the past four years:

TYPE OF TRAFFIC

Year	Local passenger cars	Foreign passenger cars	Commercial vehicles	Total vehicles
1939	205	194	82	481
1940	214	203	94	511
1941	266	268	105	639
1942	247	176	102	525

Comparing 1942 traffic with 1941 as shown in the preceding table gives the following results:

	Decrease Number vehicles	Per cent
Local passenger cars	19	2.97
Foreign passenger cars	92	14.40
Commercial vehicles	3	.47
Total decrease	114	17.84

During the first two months of 1942 foreign traffic, i. e., passenger cars registered in states other than Arizona, showed a slight increase over the corresponding months of 1941. However, from March, 1942, on to the end of the year, foreign traffic decreased to a considerable extent, the total decrease for the year being 34.33 per cent, and accounted for the major decrease shown in the preceding tables.

Although traffic on the State Highway system decreased, due principally to a decrease in foreign traffic, traffic on other road systems as a whole showed a slight increase. The increase on these roads was due mainly to increased agriculture and mining activities. Also, the locations of defense projects were such that roads integrated with the State Highway system showed a marked increase of traffic. Inasmuch as traffic on the State Highway system is approximately 50% of all traffic, the 17.84% decrease on this system accounts for the 5.09% decrease in the 1942 motor vehicle fuel consumption.

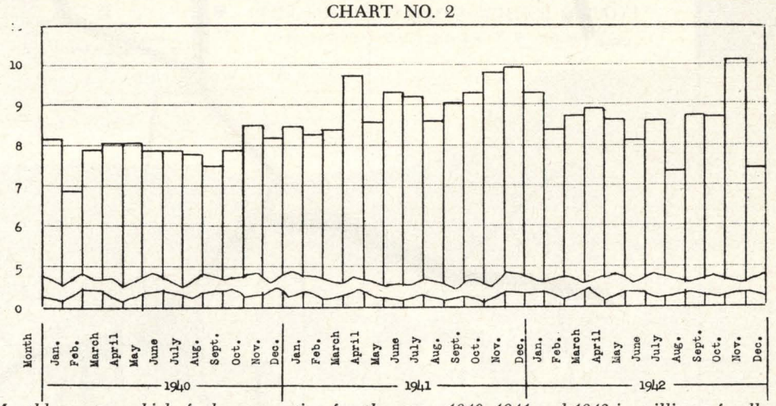
As may be seen by the following tabulation, the decrease in commercial vehicle traffic was all in the single-unit truck classification. The tabulation shows the average densities, weighted by vehicle miles traveled over the State Highway system, for the years 1936, 1940, 1941 and 1942:

Vehicle type	1936 average density	1940 average density	1941 average density	1942 average density
Busses	5.7	6.0	6.5	8.1
Single-unit trucks	66.0	69.9	77.6	72.1
Tractor-truck combinations	6.7	12.8	15.2	15.3
Truck and trailer combinations	3.8	4.8	5.9	6.2
Total vehicles	82.2	93.5	105.2	101.7

The trend of trucking types in terms of per cent based on the preceding tabulation is as follows:

Vehicle type	1936 Average density	1940 Average density	1941 Average density	1942 Average density
Single-unit trucks	86.27	79.89	78.62	77.03
Tractor-truck combinations	8.76	14.63	15.40	16.35
Truck and trailer combinations	4.97	5.48	5.98	6.62
Total per cent	100.00	100.00	100.00	100.00

CHART NO. 2



Monthly motor vehicle fuel consumption for the years 1940, 1941 and 1942 in millions of gallons.

It may be noted from the trend tabulation that the heavy combinations are gradually replacing the single-unit trucks on the State Highway system. However, it may be pointed out that the replacement occurs principally on what is termed long hauls.

The history of motor vehicle fuel consumption is the record of all traffic on all roads and streets in the State.

Chart No. 1 depicts the annual motor vehicle fuel consumption for the years 1925 to 1942. The gallonage shown is the net taxed gallons, and represents the gallonage consumed by vehicles of private ownership.

Gas rationing, curtailment of automobile and tire manufacturing will in the next few years greatly reduce the consumption of motor vehicle fuel. However, when the national emergency is over, the consumption of motor vehicle fuel will increase, and in all probability by approximately 6,700,000 gallons a year as during the years between 1933 and 1941.

Chart No. 2 depicts the monthly motor vehicle fuel consumption for the years 1940, 1941 and 1942. The erratic nature of the monthly consumption for 1942 is due to a considerable extent to the fluctuation of foreign traffic that in former years had a dependable seasonal curve, whereas in 1942 foreign traffic was anything but static.

Construction of defense projects, etc., also had a marked influence on motor vehicle fuel consumption.

In November, 1942, the net taxed motor vehicle fuel sales reached an all-time peak, due probably to the final splurge and the desire of the owners of vehicles registered in other States to be in their own bailiwick prior to rationing, rather than to any great increase in business or defense traffic during that month.

In 1942 a study was made, supervised by the Arizona Highway Planning Survey, of the 1942 inter-State and trans-State trucking of Arizona. Data for this study were taken from the Commercial Vehicle Station reports of the Motor Vehicle Division. The findings of this study were published in August, 1942. It is thought that a few short tabulations, excerpts from the original publication, might prove of interest to the readers of this article.

The following tabulation relative to load groupings clearly shows one reason, i. e., the greater carried loads, why the tractor-truck combination and the truck and trailer combination are replacing the single-unit truck on long hauls, as was brought out in discussing trends of trucking types:

PER CENT OF LOADED TRUCKS AND TRUCKING COMBINATIONS BY VARIOUS CARRIED LOAD GROUPS

Carried load group pounds	Single-unit trucks per cent	Tractor-truck combination per cent	Truck and trailer combination per cent
Under 5,000	19.64	5.59	1.94
5,000- 9,999	22.09	6.67	1.85
10,000-14,999	39.89	11.97	2.93
15,000-19,999	11.55	17.82	3.00
20,000-24,999	6.05	25.58	3.99
25,000-29,999	.57	16.97	7.90
30,000-34,999	.18	11.94	21.48
35,000-39,999	.01	1.83	44.99
40,000-44,999	.01	1.32	10.23
45,000-49,999	.01	.15	.82
50,000-54,999	.....	.05	.45
55,000-59,999	.....	.06	.12
Over 59,999	.....	.05	.30
Total	100.00	100.00	100.00

In the carried load group tabulation under truck and trailer combination, 40 out of every 100 loads in the 30,000 to 34,999 lb load grouping were loads of cattle exported to California. In the same tabulation under the same heading, 92 out of every 100 loads in the 35,000 to 39,999 lb. load grouping were loads of gasoline and other oil refinery products imported principally from California.

The following tabulation shows the 1941 trucking tonnage as of carried load that crossed the Arizona border. Your attention is called to one item in this tabulation, i. e., the 274,957 ton manufactures and miscellaneous. Of the tons quoted, 206,755 were gasoline and other products of oil refineries.

CARRIED LOAD
1941 TRUCKING TONNAGE

Commodity	Export tons	Import tons	Trans-state tons	Total tons
Products of agriculture	75,292	82,252	68,604	226,148
Animal products	46,305	8,770	10,864	65,939
Products of mines	6,593	24,112	257	30,962
Products of forests	1,915	5,779	425	8,119
Manufactures and misc.	29,107	274,957	11,522	315,586
General freights	67,816	160,927	67,404	296,147
Total	227,028	556,797	159,076	942,901

The following tabulation will probably prove of interest to the residents of the various counties in Arizona, as it shows the number of tons, carried load, exported and imported by each county in 1941.

County	Export tons	Import tons
Apache	1,108	5,102
Cochise	3,145	14,500
Coconino	3,057	12,969
Gila	841	6,401
Graham	2,718	9,502
Greenlee	1,268	15,112
Maricopa	156,586	325,788
Mohave	2,524	13,435
Navajo	731	16,342
Pima	12,596	82,441
Pinal	3,875	8,815
Santa Cruz	.559	1,696
Yavapai	10,486	14,841
Yuma	27,534	29,853
Total	227,028	556,797

In 1942 the State Highway Department was forced to replace timber stringers in several bridges. The failure of the stringers was attributed to the severe pounding inflicted by heavy truck loads.

In March, 1942, the Arizona Highway Planning Survey submitted a letter to the Public Roads Administration asking for approval to conduct a trucking survey to determine the character and nature of trucking destructive to bridges and highways in Arizona. Approval was obtained and field work began in April, 1942.

The finds have proved helpful in many ways. However, the greatest potential value of the survey lies in the information gleaned that will prove of value in helping to enact uniform trucking legislation by the various States.

The following tabulation, an excerpt from the original report, shows in terms of per cent the inter-State nature of trucking loads weighed in Arizona that are considered destructive to highway surface and bridges. The tabulation shows the origin and destination by States of loads of 800 and over "C" value. The highest value of "C" in the formula $C = \frac{W}{L + 40}$ in which L is the distance in feet between the first and last axle of the vehicle, or of any interior group of axles, and W is the total weight of the vehicle of any interior group of axles, was used to determine the value of "C."

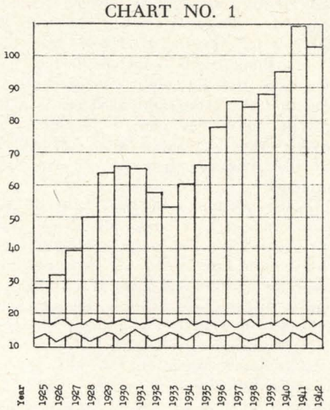
The value of "C" taking into consideration the weight, length, and the factor 40, is generally used to determine load concentration on bridges and surfacing, and by this determination the value 800 is considered the maximum safe load limit.

ORIGIN AND DESTINATION OF TRUCKING LOADS OF 800 AND OVER "C" VALUE

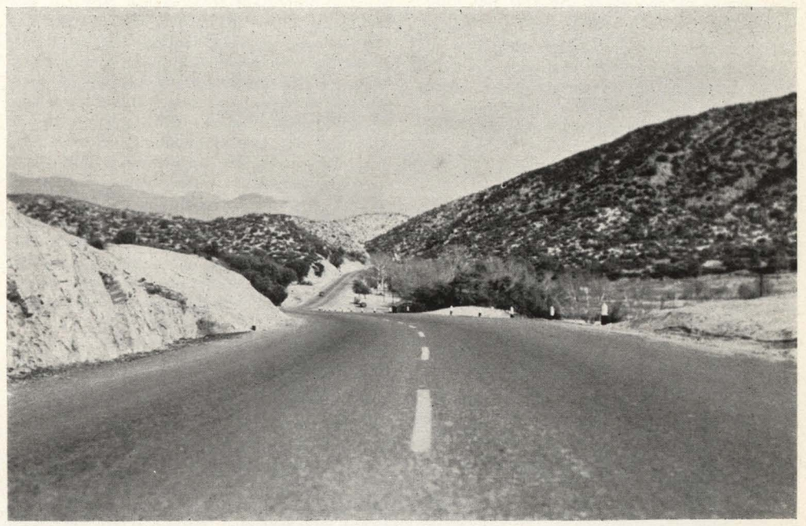
	Origin	Destination
Arizona	13.91	77.39
California	74.78	9.57
Colorado	3.48	.87
Texas	1.74	6.95
New Mexico	.87	.....
Utah	3.48	2.61
Kansas	.87	1.74
Oklahoma	.87	.....
Nebraska	.....	.87
Total	100.00	100.00

The facts and figures as related in this article are but a few of the findings that are gleaned each year by the Arizona Highway Planning Survey in its research of the various phases of traffic, facts and figures that are used not only by the State Highway Department in planning future roads and future road construction, but by various business concerns that cater to the traveling public.

CHART NO. 1



Annual motor vehicle fuel consumption for the year 1925 to 1942 in millions of gallons



The scientific study of highway traffic in Arizona by the Arizona Highway Planning Survey of the Arizona Highway Department is valuable for post-war planning as well as keeping an accurate picture of month by month travel trends. Not only is careful check made of the volume of traffic but an itemized breakdown is also tabulated of the various types of vehicles in the flow, valuable information for the engineer and the road planner.

Yours Sincerely

METEOR CRATER:

. . . Your November issue as usual was full of very interesting matter. The story of the "Meteor Crater" is of especial interest, the writer having for years read every thing published concerning this crater. As it has been some time since anything has been written about Meteor Crater, this story of yours seems to bring this subject up to date and is especially interesting.

After reading this story, my thoughts turned to a visit the writer made to Honolulu in 1911 as a member of the party promoted by the A.I.M.E. on a visit to Japan. Among the party was a man that was connected with a mining company of Butte, Montana. This man was born near Honolulu and had a brother there who was the manager of a large sugar plantation on the Islands. This man informed me that the company, for whom his brother was manager, had spent five million dollars to install a pumping plant that raised water for irrigation of their sugar lands. It seems that the time taken to raise a crop of sugar cane usually was about 12 months, and through the dry season water had to be raised from wells to keep the cane growing, hence the expensive pumping plant. Now the question that came to my mind after reading this crater story is this: Is there any land near by that could be developed under irrigation? If so, is the altitude suitable for producing crops that might have a value sufficient to make use of the water raised from the shaft that can be sunk to reach the meteor for an additional source of revenue.

In view of the estimate of the weight of this meteor at ten million tons having a value of $50.00 per ton, or 50 million dollars, this added to the value of the irrigation project, it would seem to me, that the pumping difficulties mentioned are negligible and can be easily overcome. The fact that the fine sand stopped the first effort to get this shaft down could easily be overcome by the use of caissons, and filtering sumps.

If there is a sufficiently large body of water found that might constitute a permanent supply, the profits from the irrigation project might easily make this a very fine investment, the same as the five million dollar pumping plant near Honolulu.

T. H. Proske,
Denver, Colorado.

• *Mr. Proske, intrigued by the supposed wealth in the meteor of Meteor Crater as are so many other people, may have much wisdom in his suggestion. So far the only apparent value in Meteor Crater has been that of a scenic and natural wonder.*

* * *

TRIBUTE TO MEXICO:

. . . In referring to your September issue of Arizona Highways, giving a salute to Mexico am moved to say that this issue is the finest publication I have seen on Mexico. Your artist and editorial staff are to be complimented on its excellence and I can only say it is a great tribute from a great state to a neighbor nation.

Although we are in another section of the United States it may interest you to know that our interest is as intense in your section of the country as is your own and we can only commend you on the good work you are doing as is evidenced by this publication.

William Jacob,
Canton, Ohio.

• *A fine commentary on the September issue of Arizona Highways has been a request just received from the government of Mexico to send a supply of the magazines to each of the Mexican consulate offices in the United States, a request with which Arizona Highways is both happy and proud to comply.*

* * *

SOMEWHERE IN NEW GUINEA:

Today Mrs. Knight surprised me with the October issue of Arizona Highways for which I am very thankful. It made me feel so happily lonesome that I thought it a good idea to tell you that the little sight of home is a big help to me here. One can be lonesome and still happy when he knows there still will be a place like Arizona when this job over here is completed.

I like the sentiment of your editorial too. One is so prone to feel that at home it is "business as usual." We are doing an increasingly good job here and will continue. Arizonans are well represented here and I am proud of them; we hope it will not take too long. Keep on with your efforts—we won't let you down.

F. W. Knight, 1st Lt. M. C.,
19th Bomb. Squadron,
Somewhere in New Guinea.

• *We are glad to learn Dr. Knight of Safford, serving with the Air Forces in the South Pacific enjoys a glimpse of home through the pages of Arizona Highways. Despite the apparent belief that folks at home are going blithely about their business as usual, the war is close to us here, too, affecting all of us.*

* * *

WANDERERS IN THE DESERT LAND:

. . . This is a sort of double barrelled letter —in the first place to express my appreciation of Arizona Highways, particularly this last Christmas number; and secondly to ask if you have any suggestions to make on a matter which is rather important with us just now . . . the finding of a new wilderness home location.

As you are doubtless familiar both with ourselves and our problem through the monthly feature which we have been running for some time in Desert Magazine, I think I can skip all introductory remarks. But it occurred to me the other day that if anyone is in a position to make suggestions regarding a little spot of wilderness—with water—you, as editor of Arizona Highways, probably could do so.

In the almost thirty years that have elapsed since I previously travelled in Arizona, the country has changed. Not the country, of course, but the populations and development areas. This is fine for Prosperity and Progress . . . but a little disheartening for one who feels much about settled areas as Daniel Boone did. The Taylor Act has complicated things too. And seemingly every little trickle of spring water has been tagged.

Of course this is a pessimistic view. There must be—and undoubtedly are—dozens of isolated suitable places . . . *if* we could connect with them. Our needs are not elaborate—fortunately perhaps for a Thoreauesque purse. Even an abandoned mining claim would be quite in order, providing it possessed the essentials of wood, water and the possibility of raising a garden. We have seen beautiful places in Arizona; but none that offered us the possibility of locating. The place does have to have a certain amount of inspiring atmosphere. But this is a detail upon which it is unnecessary to elaborate. Knowing you as I do, through your printed words in A. H., I am aware that you know all about the intangible "something" for which poets—and similar unhappy mortals —seek.

Somewhere there is someone who has just what we want. It may be some old timer who knows of some forgotten location in the hills. *Quien sabe?* And if you are in a position to throw out a line of suggestions we'll be very appreciative.

Marshal South,
St. George, Utah.

• *Marshal and Tanya South and their children are true wanderers in the desert. For several years now their home "Yaquitepec" has been on Ghost Mountain in the California desert. Life at Yaquitepec has been described in articles appearing in Desert Magazine, and they are a priceless contribution to the literature of the west.*

The South family lives as closely to nature as is possible in this modern century of ours. At Ghost Mountain, for instance, their water came from the rain that collected in rocky cisterns. But finally the rains did not come and the Souths had to wander again into the desert seeking a new home.

Should any reader in Arizona have any suggestions as to where the Souths may find a home in the desert wilderness, Arizona Highways will be happy to forward their suggestions to the South family.

* * *

PAN AMERICA:

. . . I have read the Christmas issue of your magazine which, with its interesting articles and colorful photographs, would serve us considerably in our efforts to make known the attractions of the United States in Latin America.

Would it be possible for you to send us one or two copies of this issue for our files? If this office could be placed on your regular mailing list it would serve to keep us posted on the development of good roads and travel attractions in your state.

Francisco J. Hernández,
Chief, Travel Division.
Pan American Union,
Washington, D. C.

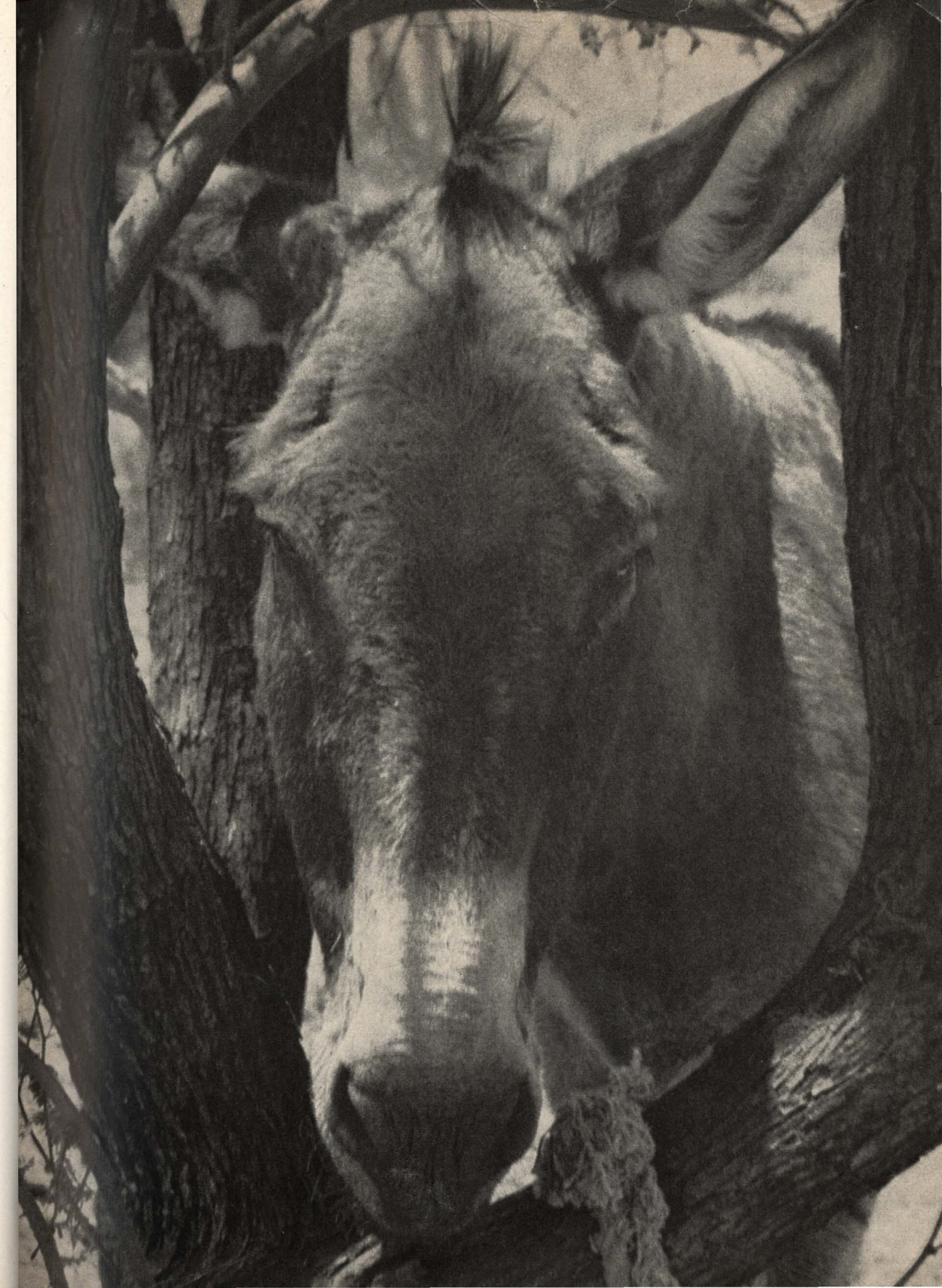
• *Travel Chief Hernández will receive each month copies of Arizona Highways to remind him of America's colorful west.*

* * *

PURPLE SHADOWS ON THE MOUNTAINS:

. . . Just a note to tell you how much I have enjoyed your remarkable magazine. As an amateur photographer I take particular delight in your wonderful illustrations. The December number is a work of art. I wish I could frame and hang on my walls all of the marvelous color pictures and most of the black and whites. In my boyhood, I lived three years in Cananea, Mexico, where I looked out over the desert every day and came to love it. Your marvelous color pictures take me back. Again I see the purple shadows on the mountains—shadows I tried so hard to photograph.

Dr. Walter C. Alvarez,
Mayo Clinic,
Rochester, Minn.



Miss Elenor Hitt, Asst. Lib.,
State Library,
Sacramento, Calif.

NO TOLL FERRIES OR TOLL BRIDGES ON STATE HIGHWAY SYSTEM.

U T A H

1943

STATE HIGHWAY DEPARTMENT

ROAD MAP of ARIZONA

ARIZONA STATE HIGHWAY COMMISSION
PHOENIX, ARIZONA.

LEGEND

- NATIONAL FOREST
- INDIAN RESERVATION
- PAVED ROADS-ALL TYPES
- GRAVEL ROAD
- GRADED ROAD-LOW TYPE
- INQUIRE LOCALLY FOR ROAD CONDITION
- (70) U.S. HIGHWAY ROUTE NUMBER
- (73) STATE HIGHWAY ROUTE NUMBER
- 25 POINT OF INTEREST
- NATIONAL MONUMENT OR PARK
- INTERMEDIATE MILEAGE
- ★57★ TOTAL MILEAGE BETWEEN STARS
- POPULATION UNDER 1,000
- 1,000 5,000
- 5,000 10,000
- OVER 25,000
- RED CROSS FIRST AID STATION
- INTERNATIONAL PORT OF ENTRY

STATE ROUTE 69 — STATE HIGHWAY ROUTE MARKER

ARIZONA US 70 — U.S. HIGHWAY ROUTE MARKER

R X R — ROUND SIGNS ALWAYS DESIGNATE RAILROAD CROSSING

SIDE ROAD — SQUARE SIGNS ALWAYS DESIGNATE CAUTION

DIAMOND-SHAPED SIGNS ALWAYS REQUIRE REDUCED SPEED

STATE STOP HIGHWAY — OCTAGONAL SIGNS ALWAYS REQUIRE A COMPLETE STOP

Compiled and drawn by W. M. DeMeree